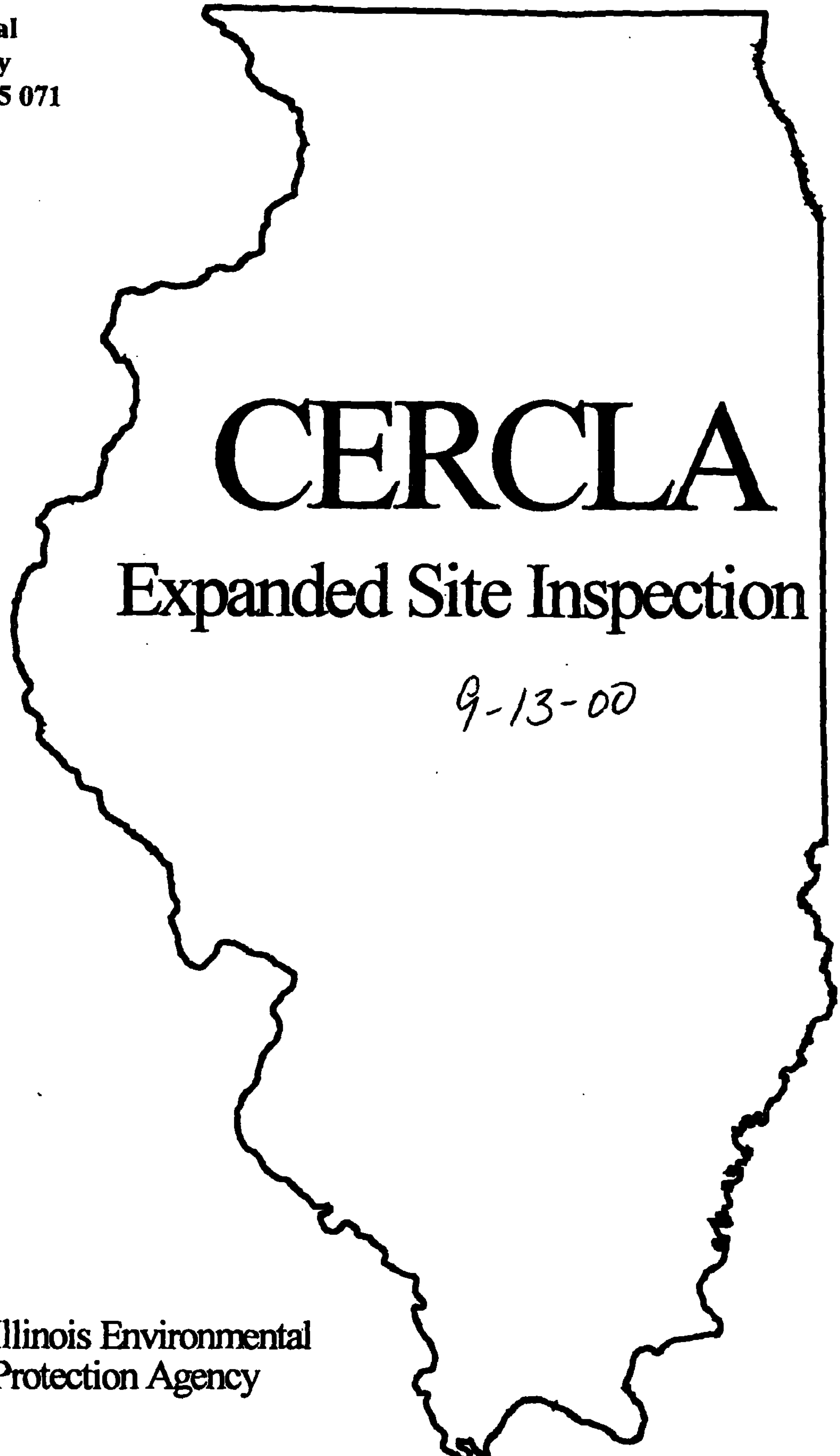
I & M Canal
Will County
ILD 984 785 071
SF/Tech



CERCLA

Expanded Site Inspection

9-13-00

Illinois Environmental
Protection Agency

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1. INTRODUCTION

On September 3, 1999 Illinois Environmental Protection Agency's (IL EPA) Site Assessment Program was tasked by the United States Environmental Protection Agency (USEPA) to conduct a CERCLA Expanded Site Inspection in the Illinois and Michigan Canal (I & M Canal) in the Joliet area in Illinois. This investigation was conducted because previous sampling in the canal showed high levels of sediment contamination.

In October of 1999, the IL EPA's Site Assessment Program prepared and submitted a work plan for the I & M Canal to the Region V offices of the USEPA. The sampling portion of the Expanded Site Inspection was conducted on November 8 and 9, 1999 when the sampling team collected a total of twenty sediment samples from the canal.

2. SITE BACKGROUND

2.1 SITE DESCRIPTION AND HISTORY

The Illinois and Michigan Canal (I & M Canal) was constructed by the State of Illinois in the mid-1800s to link Lake Michigan to the Illinois River and eventually to the Mississippi River for navigational purposes. Construction of the canal started in 1836 and was completed in 1848. The route of the canal generally followed that of the DesPlaines River in its eastern portion and the Illinois River in its western portion. The canal extended from the South Branch of the Chicago River in Chicago to the Illinois River at LaSalle Peru. The original canal cross section was designed with a 36-foot bottom width, a 60-foot water-line width and a 6-foot depth. Navigation in the canal eventually declined and finally was terminated in 1933 after the opening of the Chicago Sanitary & Ship Canal and the construction of a series of locks and dams on the Illinois River in the early 1900s.

In 1984, the federal government designated the I & M Canal as a National Heritage Corridor because of its historical significance and strong local interest in preserving, rehabilitating and restoring it. The State of Illinois now manages the canal as a historical and recreational corridor. Local groups and the state want to maintain some flowing water in the canal for recreation purposes and to improve the aesthetics of the canal. However, the canal has not been maintained for a very long time and in some places it has been almost completely filled in with sediment.

The portion of the canal which was investigated by the Illinois EPA in November, 1999 runs roughly from the City of Lemont south to where the canal enters the Des Plaines River in the City of Joliet (see Figure 1). The Canal in these areas varies greatly in width and depth of water, with some areas being almost completely filled in with a thick layer of sediment. Based on observations made during the sampling event and the analytical results, much of this sediment appears to be heavily contaminated with an oily product with high levels of metals, volatiles and semi-volatiles.

2.2 PREVIOUS INVESTIGATIONS

In September of 1997 sediment sampling was conducted in the I & M Canal as part of an investigation of the former US Steel Plant located in Joliet, Illinois. This sampling showed that large areas of the I & M Canal were severely contaminated with metals and semi-volatiles. No sampling was conducted during this event for volatiles or pesticides. Although this sampling showed that the canal was contaminated, it did not show the extent of contamination or show potential sources of the contamination. The purpose of the 1999 sampling event was to more adequately determine this information. Information on both the 1997 and 1999 sampling events is integrated into this report.

3. EXPANDED SITE INSPECTION ACTIVITIES AND ANALYTICAL RESULTS

3.1 INTRODUCTION

This section outlines the procedures utilized and observations made during the CERCLA Expanded Site Inspection conducted in the I & M Canal. Specific portions of this section contain information pertaining to the reconnaissance inspection, site representative interviews, and field sampling procedures. Also included in this section is information about the sediment samples that were collected and a description of the analytical results.

3.2 RECONNAISSANCE INSPECTION

On October 5, 1999 Mr. Peter Sorensen and Mr. Ted Prescott of the Illinois EPA conducted a reconnaissance inspection of the I & M Canal. The site reconnaissance included a visual inspection of the areas of the canal that were to be investigated to become familiar with the property, to identify potential sampling locations, and to survey the surrounding land use.

The reconnaissance revealed that the I & M Canal varies greatly in the section that was investigated between the cities of Lemont and Joliet. In the Lemont area, the canal corridor is used as a recreational area with a walking path located along the canal. South of Lemont, the canal runs through industrial properties including two large refineries. The refineries are the actively operating Citgo plant to the north and the inactive Texaco plant to the south. In the Lockport area, the canal is again used as a recreational corridor with walking paths along the canal. South of Lockport the canal flows past a couple of scrapyards and into Joliet. In Joliet the canal flows past the former coking plant for US Steel and then past the former US Steel plant and then into the Des Plaines River.

Much of the canal was found to contain only a couple of feet of water because it has been filled in extensively with sediment. In most areas this soft sediment is very deep but in the Lockport area the canal has a rocky bottom and has very little accumulation of sediment. The sediment from the Citgo plant south to the DesPlaines River (with the exception of the Lockport area) is dark black with a heavy oily sheen when it is disturbed. In many areas of the canal, including the areas with heavy contamination, carp were seen swimming.

3.3 SITE REPRESENTATIVE INTERVIEW

In October of 1999, Mr. Peter Sorensen of the Illinois EPA held conversations with several people concerning the upcoming CERCLA sampling event in the I & M Canal. The purpose of these discussions were to explain both the CERCLA Expanded Site Inspection process and the specifics concerning the sampling activities of the upcoming CERCLA sampling event. The Illinois EPA met with representatives of Texaco and Citgo at separate meetings. Mr. Ole Axvig represented Texaco and Mr. Kevin Moss and Mr. Claude Harmon represented Citgo. Meetings took place with these companies both because they own property along the canal from which sampling access was needed and because both companies are viewed as potential contributors to the contamination in the canal. In addition, Mr. Brett Wiltshire of Unocal-Chicago Carbon Company was contacted to obtain access to the canal from their property just north of the Citgo property. Mr. Dan Bell of the Illinois Department of Natural Resources and Mr. Steve Jones of the Village of Lemont were also contacted because they both own portions of the canal area investigated. Every one of these groups contacted were asked if they wanted to split samples with the Illinois EPA during the sampling event. Texaco and Citgo decided to do so on samples which were collected in the I & M Canal alongside their respective properties.

3.4 SEDIMENT SAMPLING

Twenty-six sediment samples were collected during the 1997 sampling event and twenty sediment samples were collected during the 1999 sampling event in the I & M Canal. The samples collected in 1999 were analyzed for the complete Target Compound List (see Appendix C) while the samples collected in 1997 were just analyzed for the semi-volatiles and inorganics on the Target Compound List. The sediment samples were collected in the canal from the Village of Lemont south to the point where the I & M Canal enters the Des Plaines River in Joliet. In addition, during the 1997 sampling event seven sediment samples were collected from the Des Plaines River. The purpose of the sampling events was to help determine the extent and possible sources of contamination. The majority of the samples were collected from the top foot of sediment, but several were collected from deeper in the sediment to help determine the depth of contamination.

3.5 ANALYTICAL RESULTS

This section includes a summary of the analytical results of samples collected during the 1997 and 1999 CERCLA sampling events conducted in the I & M Canal. Figure 2 shows the locations of each sediment sample. Table 1 describes each sediment sample with its location, depth and physical appearance noted. Table 2 shows a summary of the analytical results from these samples and Table 3 provides a summary of the key samples. Key samples are samples in which contaminants were detected at concentreations at least three times background levels.

The results of the samples are discussed in Sections 5.3 and 5.5 which discusses the surface water and soil exposure migration pathways. In addition, Table 4 compares the sediment analytical results to ecotoxilogical benchmarks and Table 5 compares the results to soil screening benchmarks. These also are described in greater detail in Sections 5.3 and 5.5 of this report. Complete laboratory analytical data for the samples are provided in Appendix H of this report.

As can be seen in the analytical results tables (Tables 2 through 5), the sediment samples collected downstream of the Citgo Refinery all the way to the confluence of the I & M Canal and the Des Plaines River are heavily contaminated with numerous contaminants including mainly volatiles, semi-volatiles and metals. There are areas in the canal where over the years heavy sedimentation has ocurred and these are the areas which show the highest levels of of contamination.

3.6 KEY SAMPLES

Key samples are samples in which contaminants were detected at levels three times or greater above background. Sediment sample X261 was used as the background sample to compare the other sediment sample analytical results against. Sample X261 was considered background because it was collected upstream of the location in the canal where the heavy contamination begins. The key samples are highlighted in red ink on Table 3.

As can be seen on Table 3, numerous contaminants were found in the I & M Canal sediments significantly exceeding background levels, including mainly volatiles, semi-volatiles and metals. These are discussed in greater detail in Sections 5.3 and 5.5 of this report.

4. IDENTIFICATION OF SOURCES

4.1 INTRODUCTION

This section will briefly discuss the hazardous waste source which has been identified in the initial stages of the CERCLA site investigation. It should be pointed out that the total number and nature of the sources at the site may change as the facility progresses through the CERCLA site assessment process and receives further investigation.

4.2 CONTAMINATED SEDIMENT

The sediment sampling conducted by the Illinois EPA has shown that a long stretch of the I & M Canal is heavily contaminated. The area of highest contamination is located from the Citgo Plant downstream to the confluence of the I & M Canal and the Des Plaines River in Joliet. This is an approximately ten-mile stretch of the canal.

As mentioned earlier, areas where heavy sedimentation have ocurred in the canal contain the highest levels of contamination. Based on observations made during the Illinois EPA's sampling events in 1997 and 1999, there are a couple of stretches of the canal where heavy sedimentation have ocurred, up to several feet in depth. One stretch is from the background location at sample X261 in Lemont downstream to sample X230. See Figure 2 for these locations. Downstream of X230 through the town of Lockport to X226 the canal is not as full of sediments. Portions of this area of the canal have had sediment removed from it in the past. From sample X224 downstream to the Des Plaines River the canal again contains a thick layer of sediment. These areas of thick sediments contain heavy contamination of mainly volatiles, semi-volatiles and metals. Sampling at various depths in this sediment indicated that heavy contamination exists throughout the sediment layer.

The land along the I & M Canal is heavily industrialized and has been for a long time. Because of this there are several potential contributors to the contamination that is now found in the canal. Since the worst of the contamination appears to be located downstream of the Lemont area, industries along this part of the canal will be named in this report. The locations of these facilities can be seen in Figure 2. The worst of the sediment contamination appears to be begin at the location of the Citgo Plant, a petroleum refinery. Many of the contaminants found in the canal are contaminants associated with petroleum refineries; including numerous volatiles such as benzene, toluene and xylene and poly-aromatic hydrocarbons (PAHs).

Approximately two miles downstream of the Citgo Refinery is the property formerly occupied by another large refinery; the Texaco Refinery located in Lockport. Although the sediment contamination continues alongside and downstream of the Texaco refinery, the levels of contamination for most contaminants appear to be just as heavy upstream of the facility. This indicates that although the Texaco facility may have contributed to the contamination, much of it may have come from an upstream source.

Approximately two and a half miles downstream of the Texaco property is another facility that may have contributed to the canal contamination. It is the former U.S. Steel coking plant which was used to produce coke for U.S. Steel's steel production. A byproduct of coke production is coal tars which contain many PAHs. Many of these contaminants were detected in the sediments of the I & M Canal as well as in the Des Plaines River downstream of the former coking facility at levels much higher than were detected anywhere upstream. In addition, during a previous CERCLA investigation conducted at this facility in 1996 (an Expanded Site Inspection conducted under the name of "Bill's Excavating"), coal tars were observed on this property along the I & M Canal.

5. MIGRATION PATHWAYS

5.1 INTRODUCTION

The CERCLA Site Assessment Program identifies three migration pathways and one exposure pathway by which hazardous substances may pose a threat to human health and/or the environment. Consequently, sites are evaluated on their known or potential impact to these four pathways. The pathways evaluated are groundwater migration, surface water migration, air migration and soil exposure. The following section discusses these pathways and the site's impact or potential impact on them and on the various human and environmental targets. These targets include human populations, fisheries, endangered species, wetlands and other sensitive environments.

5.2 Groundwater Pathway

No groundwater samples were collected during the 1997 or 1999 sampling event because at this time it is not beleived that the contaminants located in the sediments of the canal are a threat to groundwater. The contamination appears to be bound in the sediment of the canal unless disturbed, when it rises into the waters of the canal and flows downstream.

5.3 Surface Water Pathway

The section of the I & M Canal that was investigated runs from the Village of Lemont downstream to where the canal enters the Des Plaines River in Joliet. See Figure 1 for these locations. The I & M Canal basically runs parallel to the Sanitary and Ship Canal and the Des Plaines River. From Lemont to the Citgo Plant the canal flows in a southwest direction.

Downstream from Citgo the canal flows in a southerly direction until it enters the Des Plaines River in Joliet. The Des Plaines River flows through Joliet and then travels southwest until it joins the Kankakee River and forms the Illinois River.

During the two Illinois sampling events, forty-six sediment samples were collected from the I & M Canal. The sediment samples collected during the sampling events were compared to ecological benchmarks to help determine whether the I & M Canal has been impacted. Two sources of benchmarks were used for this comparison: Ontario sediment quality guidelines and US EPA ecotox thresholds. Ontario sediment quality guidelines are non-regulatory ecological benchmark values that serve as indicators of potential aquatic impacts. Levels of contaminants below Ontario benchmarks indicate a level of pollution which has no effect on the majority of the sediment-dwelling organisms. Contaminants for which no Ontario benchmarks were available were compared to US EPA ecotox thresholds. Ecotox thresholds are ecological benchmarks above which there is sufficient concern regarding adverse ecological effects to warrant further site investigation. Ecotox thresholds are to be used for screening purposes and are not regulatory criteria, site-specific cleanup standards or remediation goals. The analytical results from the sediment samples are compared to these benchmarks on Table 4 with the ones exceeding the benchmarks printed in red ink.

As can be seen in Table 4, sediment in much of the canal from Lemont to Joliet greatly exceed ecological benchmarks for numerous volatiles, semi-volatiles, pesticides and metals. It should also be noted that during the sampling event, blue herons and other water birds that utilize the canal as a fish supply were observed along the canal. Sens Env info from DNR here...

In addition to ecological concerns, the I & M Canal is used for fishing by people from the area. According to an employee at the I & M Canal museum located in Lockport , there are areas of the canal in Lockport which are used as fishing areas. In addition, during the Illinois EPA sampling event in November, 1999, signs of people fishing such as fishing line and bobbers were found along several areas of the canal. No fish studies have been conducted to determine whether fish in the canal have taken up contamination from the contaminated sediments and would pose a threat to humans or animals that may eat the fish.

5.4 Air Pathway

The contaminated sediment of the I & M Canal is covered by the water of the canal. Because of this and the fact that there have been no documented complaints concerning air problems, it is unlikely that contaminants in the sediment would be of concern for the air pathway.

5.5 Soil Exposure

As mentioned earlier, much of the I & M Canal which was investigated was highly contaminated. Exposure of the public to this sediment is limited because the sediment is covered by the waters of the canal. However, portions of the canal are used by the public as recreational areas. Portions of the canal have walking trails alongside the canal and thus increase the number of people using the canal as a recreational area. Because of this recreational use, it is likely that people may occasionally be exposed to the contaminated sediments when they enter the canal.

This would be especially likely for children because they would be the the ones most likely to enter the water in the canal.

Because of this potential exposure, the analytical results from the sediments were compared to human health based benchmarks contained in the Superfund Data Chemical Matrix (SCDM). It should be pointed out that comparison to these benchmarks may not be entirely appropriate since these benchmarks were formulated to be used for residential soils and not sediments. However, they can be used for a comparison to give an idea of the levels of contamination in the canal compared to human health based benchmarks. It should also be pointed out that for many contaminants found in the canal there are no benchmarks comparison values found in SCDM, thus, no comparison can be made.

As can be seen in Table 5, much of the sediment in the canal exceeds the soil exposure benchmarks for one contaminant, benzo (a) pyrene. Many of these areas greatly exceed the benchmarks for benzo (a) pyrene as the SCDM benchmark for residential soil exposure to benzo (a) pyrene is 80 parts per billion and the sediment in the canal was found to contain levels up to 180,000 parts per billion. These results will be further reviewed by the Illinois Department of Public Health to more adequately determine potential human health hazards of these contaminated sediments.

Appendix A

Figures

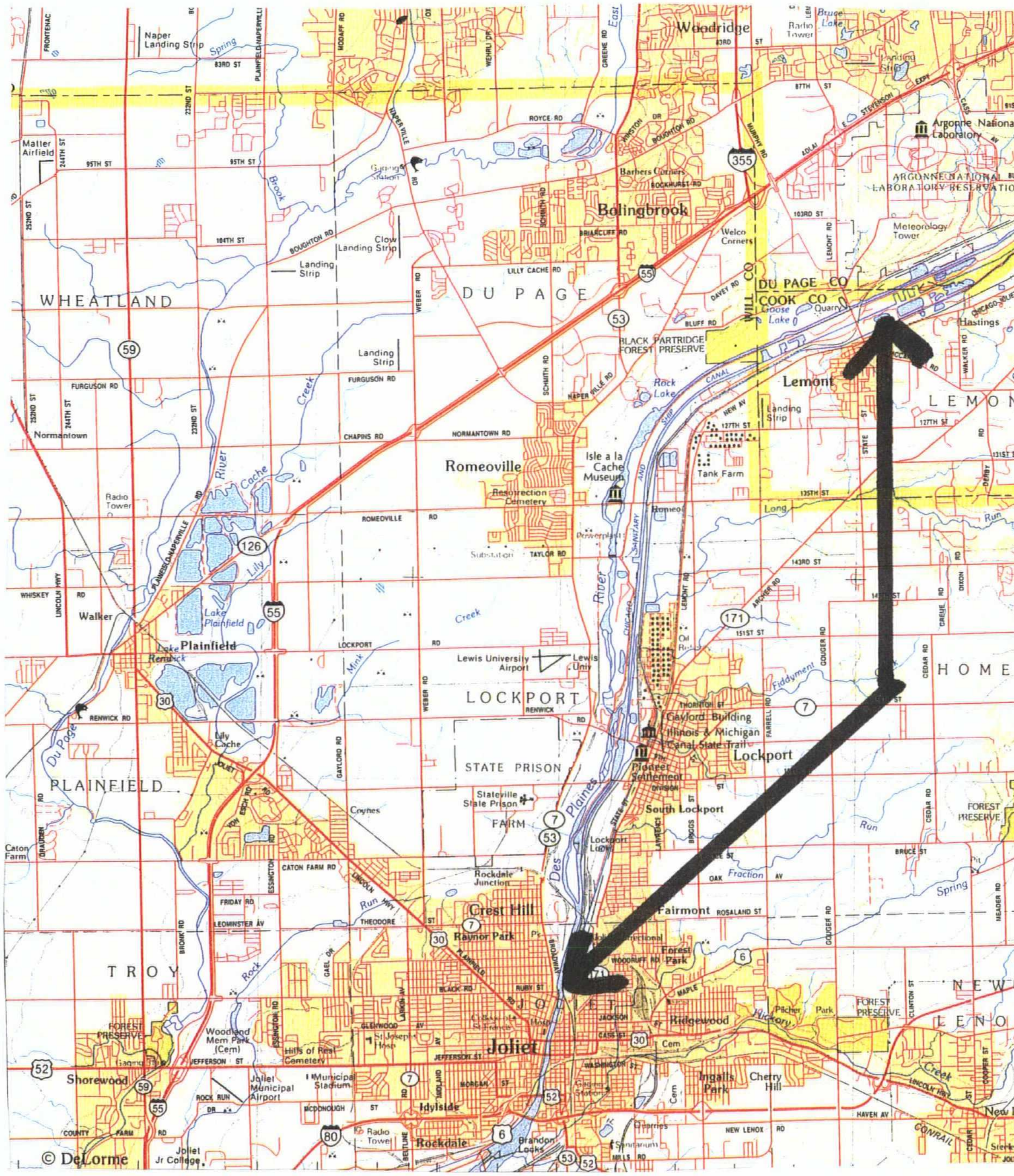


Figure 1

Section of I & M Canal Investigated During 1997 and 1999 CERCLA Sampling Events

Figure 2

I & M Canal

Sediment Sample Location Map

Base Maps: USGS Topographic Maps
Sag Bridge 1973, Romeoville 1980, Joliet 1973

Appendix B

Tables

Table 1

I & M Canal Sediment Analytical Results

Sampling Location	X261	X201	X202	X203	X204	X205	X206	X207	X208	X209	X210	X211	X212	X213	X214	X215	X216	X217
Date Collected	11-8-00 Bkgd.	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07
Water Depth	2'	14'	8'	14'		19'	13'	7'	7'	7'	7'	7'	7'	7'	7'	6'	6'	6'
Depth in Sediment	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	2'	6'	top 1'	top 1'	4'	top 1'	top 1'	top 1'	top 1'
Volatiles																		
Cyclohexane	20 U																	
Benzene	20 U																	
Methylcyclohexane	20 UJ																	
Toluene	1 J																	
Xylenes (total)	0.5 J																	
Isopropylbenzene	20 U																	
Semi-Volatiles																		
Naphthalene			3400 J	17000 J	2700 J	260000	100 J	11000 J		7100 J	4600 J	2400 J			1800 J	1800 J	770 J	2300 J
2-Methylnaphthalene	20000 U	8000 J	1600 J			18000 J	260 J	9600 J		4200 J	4000 J					1600 J	1900 J	2200 J
Acenaphthylene			3600 J	26000 J		13000 J					4400 J		1200 J		1900 J	2800 J		3600 J
Acenaphthene	20000 U	9000 J	17000	110000	5800	270000		10000 J	190000	30000	16000	10000 J	1600 J	720 J	7500 J	11000	2700 J	5000 J
Dibenzofuran	20000 U	4600 J	2000 J	27000 J	2300 J	120000			110000	9300 J	4900 J			490 J				
Fluorene	20000 U	10000 J	11000	100000	2500 J	220000		8600 J	240000	35000	17000	11000	1500 J	1000 J	6900 J	11000	2600 J	4100 J
Phenanthrene	610 J	60000	75000 D	280000	5000	900000 D	150 J	54000	1200000 D	210000 D	110000 D	69000	8700	4300	49000 D	94000 D	13000	34000
Anthracene	20000 UJ	13000 J	27000	200000	2200 J	220000		14000 J	190000	63000	35000	21000	5400	1200 J	12000	26000	3800 J	10000 J
Carbazole	20000 UJ					130000												
Di-n-Butylphthalate			3800 JB				90 JB			4000 JB	2700 JB		1500 JB	1400 JB				
Fluoranthene	2200 J	37000	45000 D	460000	21000	610000 D	170 J	34000	660000	200000 D	84000 D	43000	46000 D	4300	32000	27000 D	11000	48000
Pyrene	1400 J	32000	75000 D	300000	16000	240000	360 J	46000	380000	68000	55000 D	60000	16000	3000	61000	39000 D	14000	46000
Benzo(a)anthracene	20000 UJ	25000	42000	210000	6000 J	180000	200 J	16000 J	220000	69000 D	65000	28000	16000	1400 J	19000		5600	29000
Chrysene	20000 UJ	32000	42000	250000	7500	220000	340 J	18000 J	230000	72000 D	73000	26000	17000	1400 J	22000		5600	26000
bis(2-Ethylhexyl)phthalate	20000 UJ				1600 J		380 J											
Benzo(b)fluoranthene	20000 UJ	20000	15000	170000	6000	140000	200 J	7400 J	160000	56000 D	34000	10000 J	14000	680 J	7000 J	15000	2300 J	11000
Benzo(k)fluoranthene	20000 UJ	20000	24000	140000	5300	87000	130 J	13000 J	110000	41000 DJ	37000	14000	11000	950 J	7500 J	16000	3300 J	15000
Benzo(a)pyrene	20000 UJ	23000	32000	180000	5700	110000	220 J	18000 J	130000	54000 D	46000	22000	13000	940 J	16000	30000	4400 J	23000
Indeno(1,2,3-cd)pyrene	20000 UJ	14000 J	8500	120000	3400 J	74000	130 J	8200 J	85000 J	29000	22000	7800 J	8500	460 J	9900	10000	2200 J	10000 J
Dibenzo(a,h)anthracene	20000 UJ	5300 J	3200 J	41000 J	1200 J	34000 J	81 J		38000 J	16000	9200 J	3200 J	3000 J			5000 J	820 J	3300 J
Benzo(g,h,i)perylene	20000 UJ	13000 J	6100	100000	2400 J	55000 J	190 J	11000 J	61000 J	20000	14000	7100 J	6300		8500 J	9400 J	2500 J	9500 J
Pesticides/PCBs																		
alpha-BHC	3.3 U																	
beta-BHC	3.3 U																	
delta-BHC	3.3 U																	
gamma-BHC (Lindane)	3.3 U																	
Heptachlor	3.3 U																	
Aldrin	3.3 U																	
Heptachlor epoxide	3.3 U																	
Endosulfan I	3.3 U																	
Dieldrin	6.5 U																	
4,4'-DDE	27																	
Endrin	6.5 U																	
Endosulfan II	6.5 U																	
4,4'-DDD	13																	
Endosulfan sulfate	6.5 U																	
4,4'-DDT	2.2 J																	
Methoxychlor	33 U																	
Endrin ketone	6.5 U																	
Endrin aldehyde	6.5 U																	
gamma-Chlordane	2.0 J																	
Aroclor-1242	65 U																	
Aroclor-1248	65 U																	
Inorganics																		
Aluminum	9600	6660	8470	1360	1420	3540	4160	7270	8740	9980	8970	7380	3200	9730	9430	8290	8050	7440
Antimony	12.1 UJ																	
Arsenic	8.9 J	24.9	22.1	2.3 B	3.6 B	15.4	2.1 B	14.1 B	22.3	27.5	14.6 B	16.9	6.1	5.1	8.3	9.7	8.8	21.3
Barium	72.5	294	172	33.7 B	26 B	69.7	71.3	115	188	237	178	104	53.2 B	68.4	87	97.7	83	150
Beryllium	0.93 J	0.8 B	0.68 B			0.38 B	0.43 B	0.57 B	0.57 B	0.66 B	0.73 B	0.71 B	0.42 B	0.55 B	0.75 B	0.69 B	0.71 B	0.77 B
Cadmium	1.6	47.9	4.5	3.3	2	8	2.4	2	3.4	4.4	2.7	3	2.4					
Calcium	57000	82600	35200	39000	67800	55200	60100	38700	35400	39800	33900	27100	36800	26100	30800	31900	26800	43400
Chromium	24.6	511	62.1	27.6	16.6	48.4	32.7	39.1	109	166	62.7	33.5	32.5	22	22.9	22.8	19.5	35.1
Cobalt	12.6	11.2 B	10.4 B	3.5 B	5 B	6.3 B	5 B	9.4 B	11 B	11.3 B	11 B	10.2 B	6.7 B	10.3 B	9 B	8.4 B	8.1 B	8.5 B
Copper	44.1	378	163	26.7	69.1	121	47.9	121	182	247	152	96.1	142	41.9	56.6	78.6	53.6	166
Iron	22000	24100	40500	7060	23600	14800	12300	25700	30000	38300	46900	72300	38700	23200	28700	20100	18500	32700
Lead	128	635	352	60	31.2	560	120	272	302	396	241	166	123	146	78.2	92.7	102	282
Magnesium	22400	45000	19400	21200	37900	31000	27200	20400	18300	21200	18400	15000	16000	14900	17600	18000	15000	24100
Manganese	462 J	370	369	152	252	239	301	376	357	411	436	504	355	305	435	406	317	351
Mercury	0.26 J	5	6.7	0.18		1.1	0.27	3.3	6.3	8.6	5.7	4.4	0.52	1.1	1.6	2.6	0.99	3.3
Nickel	26.4	108	25	28.8	34.7	34.1	16.9	25.9	27.2	31.6	22.4	18.2	14.8	24.7	28	24.3	24.6	25.6
Potassium	1460	988 B	1700 B			410 B	529 B	1070 B	1570 B	1650 B	1100 B	927 B		1550 B	1270 B	933 B	1130 B	1410 B
Selenium	0.23 UJ																	
Silver	1.7 U	10.6	4 B					3.3 B	4.7	6.3	2.4 B				2 B	1.9 B	2.1 B	2.6 B
Sodium	372	460 B	444 B	261 B	229 B	327 B	352 B	328 B	303 B	366 B	319 B	318	233 B	267 B	251 B	259 B	208 B	232 B
Thallium	0.34 U	1.2 B							0.55 B	0.66 B	0.43 B			0.34 B				0.39 B
Vanadium	23.3	17.6 B	22.2	5.8 B	7.6 B	6.2 B	9.8 B	19.2 B	21.1	23.6	23.4	21.6	11.6 B	19.5	21.5	19.5	18.8	20.7
Zinc	212	1940	762	155	148	757	179	487	677	757	564	454	161	167	226	352	209	593

Sampling Location	X218	X219	X220	X221	X222	X223	X224	X225	X226	X227	X242	X228	X243	X229	X230	X244	X245S
Date Collected	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-22-07	9-23-07	9-23-07	9-23-07	9-23-07	11-8-00	9-23-07	11-8-00	9-23-07	9-23-07	11-8-00	11-8-00
Water Depth	6"	6"	6"	6"	6"	6"			2'	1'	1.5'			1'	1'	1'	1.5'
Depth in Sediment	top 1'	4'	7'	top 1'	4'	7'	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 6"	top 1'	top 1'	top 6"	1'
Volatiles																	
Cyclohexane											31					1700 J	290
Benzene											15 U						4 J
Methylcyclohexane											130 J					25000	640 J
Toluene											0.9 J		0.7 J				5 J
Xylenes (total)											5 J					400 J	97 J
Isopropylbenzene											8 J					400 J	64 J
Semi-Volatiles																	
Naphthalene			4300 J	26000							1100 J						
2-Methylnaphthalene			1900 J	11000												1800 J	
Acenaphthylene			3500 J	3900 J	1600 J	110 J		110 J									
Acenaphthene	4400 J	3500 J	8500	18000	910 J	630 J	61 J		390 J						1100 J	3500 J	
Dibenzofuran			2600 J	1100 J				110 J								2800 J	
Fluorene	4700 J	3500 J	7800	10000		110 J		200 J							1500 J	5600 J	
Phenanthrene	1600 J	24000	41000 D	100000 D	1100 J	420 J	510 J	1900		89 J	2800 J	410 J	3300 J	630 J	1700 J	23000	
Anthracene	9000	6700 J	18000	21000	2100 J	260 J	130 J	340 J				110 J	430 J	2000 J		4400 J	
Carbazole								73 J					350 J				
Di-n-Butylphthalate						210 JB	170 JB	66 JB	290 JB	540 B		310 JB		940 JB	1100 JB		
Fluoranthene	23000	28000	120000 D	100000 D	11000	1200	1400	3000	180 J	210 J	1700 J	1400	4500 J	2700 J	6600	9300 J	
Pyrene	14000	15000 J	31000	57000 D	12000	960	730	1000	340 J	170 J	2900 J	740	4300 J	6000	13000	14000 J	
Benzo(a)anthracene	9400	11000 J	37000		3900 J	660	360 J	600		83 J	1300 J	440 J	2000 J	1800 J	2700 J	5300 J	
Chrysene	12000	12000 J	44000	34000	7000	880	410	710		95 J	1600 J	530 J	1900 J	2800 J	4500 J	8300 J	
bis(2-Ethylhexyl)phthalate				38000			330 J	82 J			1200 J	150 J				3100 J	
Benzo(b)fluoranthene	6400	10000 J	38000	22000	4100 J	700	360 J	540		86 J		530 J	2300 J		1500 J	3000 J	
Benzo(k)fluoranthene	4900 J	7200 J	30000	20000	3500 J	750	280 J	460		93 J		570 J	670 J			630 J	
Benzo(a)pyrene	5400 J	11000 J	32000	41000	3600 J	850	330 J	540		87 J	990 J	570 J	1400 J	1600 J	1400 J	3100 J	
Indeno(1,2,3-cd)pyrene	2400 J		10000	15000		580 J	170 J	300 J		76 J		380 J	870 J			1500 J	
Dibenzo(a,h)anthracene	960 J		3700 J	3600 J		200 J											
Benzo(g,h,i)perylene	2800 J		7800	15000		580 J		350 J		80 J		350 J	840 J			2700 J	
Pesticides/PCBs																	
alpha-BHC											2.5 U		2.0 U			2.7 UL	2.7 U
beta-BHC											0.24 J		2.0 U			2.7 UL	1.6 J
delta-BHC											0.25 J		2.0 U			2.7 UL	2.7 U
gamma-BHC (Lindane)											2.5 R		2.0 U			2.7 UL	2.7 U
Heptachlor											2.5 R		2.0 U			2.7 UL	2.7 U
Aldrin											2.5 R		2.0 U			2.7 UL	2.7 U
Heptachlor epoxide											2.5 U		2.0 U			2.2 J	2.7 U
Endosulfan I											2.5 U		0.070 J			1.1 J	1.1 J
Dieldrin											8.1 J		3.8 U			4.6 J	4.4 J
4,4'-DDE											31		0.68 J			30 J	15
Endrin											25 J		3.8 U			14 J	10 J
Endosulfan II											8.9 J		3.8 U			5.2 UL	7.5 J
4,4'-DDD											6.4 J		1.1 J			8.9 J	5.2 J
Endosulfan sulfate											4.9 U		3.8 U			5.2 UL	5.2 U
4,4'-DDT											1.0 J		0.27 J			1.6 J	1.9 J
Methoxychlor											25 U		20 U			27 U	27 U
Endrin ketone											1.6 J		0.46 J			5.2 UL	2.3 J
Endrin aldehyde											4.9 U		3.8 U			5.2 UL	1.7 J
gamma-Chlordane											7.5 J		0.78 J			1.8 J	0.65 J
Aroclor-1242											3700 J		38 U			52 UL	52 U
Aroclor-1248											49 U		38 U			52 UL	52 U
Inorganics																	
Aluminum	7680	11400	9140	11100	6940	8560	4130	2710	4740	2610	14400	6540	1710	4710	6250	8770	
Antimony											11.2 UJ		10.0 J			10.1 UJ	
Arsenic	22.5	30.1	26.5 B	10.2	8.9	8.4	1.1 B	2.9	2.7 B	5	14.0	6.4	9.1	7.6	13.7	11.3	
Barium	99.4	321	373	111	111	91	158	63.3	44.5 B	51.4	191	62.5	63.3	53.5 B	72	91.7	
Beryllium	0.69 B	0.87 B	0.82 B	0.84 B	0.74 B	0.72 B	0.5 B	0.46 B	0.51 B	0.37 B	2.2	0.59 B	0.34 J	0.86 B	0.61 B	0.74 J	
Cadmium	7.2	6.3	5.3		5.6	2.3	1.1				8.5		0.65 U	2.1	2.5	7.0	
Calcium	12100	26600	36000	36800	20000	17800	123000	144000	51100	101000	70400	78700	113000	82000	38200	51200	
Chromium	174	218	253	30.6	59.2	47.7	11.4	10.8	11	8.8	176	21.5	6.9	63.4	67.8	212	
Cobalt	8.5 B	10.5 B	10.2 B	10.2 B	7.9 B	8.3 B	3 B	2.9 B	6.6 B	5.1 B	7.9	7.6 B	3.0	7.7 B	7.9 B	7.0	
Copper	375	375	397	105	141	81.1	24.6	19.7	22.1	16.1	146	113	31.4	56.6	97	180	
Iron	21300	28200	25700	30000	16600	20300	14600	20300	11400	25200	21100	37400	8750	19500	19800	19200	
Lead	554	526	625	245	322	150	31.6	154	91.3	20	735	91.5	41.6 J	167	388	631	
Magnesium	7180	14300	18600	20400	11300	9580	70900	74100	29900	54000	31900	35000	62100	31600	15000	25500	
Manganese	131	292	329	388	202	491	422	764	260	807	682 J	514	371 J	254	247	202 J	
Mercury	2.9	5.6	12.7	3.8	1.2	0.33	0.63		0.48	0.12	1.0 J	0.36	0.070 J	1.4	0.54	4.3 J	
Nickel	116	51.2	46.6	31.8	29	30.4	11.2	9.5	15.7	13.2	53.1	22.1	6.6 U	38.4	31.9	59.3	
Potassium	799 B	1600 B	1280 B	1500 B	753 B	1240 B	656 B	387 B	837 B	454 B	1370	948 B	346	890 B	815 B	1350	
Selenium											0.53 J		1.4 UJ			0.31 J	
Silver	2.9 B	9.1	11.7	2.9 B		1.8 B				1.5 B	1.5 U	2.3 B	1.0 U	1.6 B		1.4 U	
Sodium	290 B	295 B	318 B	262 B	221 B	302 B	692 B	376 B	216 B	273 B	408	254 B	300	202 B	318 B	285	
Thallium		0.8 B	0.72 B				0.23 B	0.24 B	0.29 B	0.25 B	0.32 U		0.21 UJ			0.29 U	
Vanadium	21.6 B	25.4	24.6	23.9	17.5	20.5	8.3 B	7.9 B	12.3 B	12.4 B	21.2	18.1	7.3	11.1 B	19.6 B	21.2	
Zinc	471	1170	1360	471	343	206	82.1	63.2	111	36.4	440	727	71.2	172	210	371	

Sampling Location	X245D	X246	X247	X248	X249	X250	X251	X231	X252	X253	X254	X255	X256	X257	X258	X259	X260	X232
Date Collected	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	9-23-07	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	11-8-00	9-23-07
Water Depth	1.5'	1.5'	1'	1.5'	1.5'	1.5'	1.5'	1'	1.5'	1.5'	6"	6"	1'	1'	2'	2'	2'	2'
Depth in Sediment	7'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 1'	5'	5'	top 6"	top 6"	2'	3'	top 2'	2'
Volatiles																		
Cyclohexane	57	1200 J	11000	70000	62000	120000	150000		170	150000	85000	4800	19 U	6 J	50	81 J	1 J	
Benzene	3 J			2800 J	3200 U	4000 U	4800		23 U	8800	8800	1200 J	19 U	19 U	14 U	21 U	18 U	
Methylcyclohexane	94 J	12000	65000	250000	230000	480000	580000		140	580000	350000	28000	19 UJ	14 J	170	530 J	0.9 J	
Toluene	2 J		620 J	12000	1500 J	3300 J	14000		23 U	7300	3400	150 J	0.6 J	19 U	14 U	21 U	0.7 J	
Xylenes (total)	18 J		20000 J	140000	50000	95000	250000		10 J	110000	110000	670 J	19 U	2 J	2 J	6 J	18 U	
Isopropylbenzene	10 J	880 J	2000 J	12000	13000	28000	23000		23 U	49000	21000	1800 J	19 U	19 U	14 U	9 J	18 U	
Semi-Volatiles																		
Naphthalene																		
2-Methylnaphthalene	35000	1500 J	170000	37000	120000	170000	150000	37000	1200 J	55000	220000	40000	510 J	19000 U	780 J	21000 U	18000 U	
Acenaphthylene																		
Acenaphthene	5000 J		13000	5500 J	12000 J	11000 J	20000 J		23000 U	6400 J	23000 J	15000 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Dibenzofuran	5300 J	1200 J	27000	3800 J	23000 J	22000 J	15000 J		23000 U	6600 J	24000 J	6800 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Fluorene	6800 J	1100 J	26000	7300 J	20000 J	26000 J	27000 J		460 J	8200 J	30600 J	16000 J	19000 U	19000 U	370 J	21000 U	18000 U	
Phenanthrene	47000	6300 J	180000	36000	100000	63000	140000	52000	3000 J	34000	140000	78000	2100 J	1500 J	11000 J	21000 U	18000 U	630 J
Anthracene	6500 J		17000	8800 J	12000 J	12000 J	21000 J		23000 U	5100 J	24000 J	13000 J	19000 U	19000 U	580 J	21000 U	18000 U	
Carbazole			28000	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 UJ	19000 UJ	1200 J	21000 UJ	18000 UJ	
Di-n-Butylphthalate																		360 JB
Fluoranthene	9700 J	1800 J	48000	11000 J	14000 J	11000 J	31000	10000	4000 J	5900 J	27000 J	8500 J	630 J	520 J	2800 J	470 J	330 J	2700
Pyrene	23000	2600 J	66000	47000	27000	29000 J	56000	10000	4100 J	12000 J	49000 J	34000	2900 J	2000 J	14000 J	1100 J	360 J	1400
Benzo(a)anthracene	9700 J	1800 J	19000	9600 J	6400 J	6800 J	14000 J	5700 J	1500 J	2800 J	12000 J	5700 J	1300 J	1000 J	25000	21000 U	18000 U	580 J
Chrysene	16000	2700 J	31000	19000 J	16000 J	11000 J	23000 J	7900	2700 J	5600 J	19000 J	9500 J	5300 J	3400 J	27000	21000 U	18000 U	920 J
bis(2-Ethylhexyl)phthalate	5200 J	1500 J	45000	33000 U	30000	29000 J	20000 J	20000	23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	14000 U	21000 U	18000 U	960 J
Benzo(b)fluoranthene	6900 J	1500 K	6700	4800 J	4900 J	3900 J	9200 J	1900 J	3200 J	1600 J	6600 J	2600 J	19000 U	19000 U	8300 J	21000 U	18000 U	930 J
Benzo(k)fluoranthene	1700 J	420 J	2000	930 J	1600 J	940 J	2300 J	1500 J	760 J	420 J	1400 J	740 J	18000 U	19000 U	1000 J	21000 U	18000 U	800 J
Benzo(a)pyrene	7600 J	1400 J	8100	6100 J	4700 J	3300 J	8300 J	2800 J	1800 J	1500 J	5800 J	2800 J	1400 J	950 J	7400 J	21000 U	18000 U	840 J
Indeno(1,2,3-cd)pyrene	3300 J	1100 J	3200	2000 J	1700 J	1300 J	3600 J		1800 J	29000 U	64000 U	890 J	19000 U	19000 U	2600 J	21000 U	18000 U	560 J
Dibenzo(a,h)anthracene	4300 J		28000	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	3100 J	21000 U	18000 U	
Benzo(g,h,i)perylene	6200 J	2100 J	8100	6400 J	3900 J	2300 J	6800 J		1800 J	29000 U	64000 U	1900 J	18000 U	19000 U	4600 J	21000 U	18000 U	
Pesticides/PCBs																		
alpha-BHC	2.5 U	2.6 U	47 U	10 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	0.75 J	0.57 J	3.6 U	3.1 U	
beta-BHC	3.1 J	0.81 J	180 J	5.7 U	46 U	57 U	47 U		4.0 U	37 J	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
delta-BHC	2.5 U	2.6 U	67 J	5.7 U	74 J	70 J	130 J		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	1.3 J	2.3 U	3.6 U	3.1 U	
gamma-BHC (Lindane)	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U		4.0 U	19 J	25 J	4.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor	2.5 U	2.6 U	47 U	2.3 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Aldrin	16 J	2.6 U	380 J	11 J	46 U	57 U	200		4.0 U	4.9 R	3.6 R	7.2 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor epoxide	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U		4.0 U	72 J	27 J	2.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Endosulfan I	2.5 U	2.6 U	47 U	24 J	46 U	57 U	91 J		0.35 J	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Dieldrin	6.9 J	3.5 J	180 J	11 U	100 J	98 J	92 U		7.7 U	9.4 R	7.0 R	2.6 J	1.5 J	6.2 U	4.5 U	7.0 U	3.1 U	
4,4'-DDE	73	18	590 J	11 U	270 J	260 J	92 U		2.2 J	58 J	7.0 R	11 J	6.4 U	1.7 J	1.7 J	4.7 J	2.1 J	
Endrin	45	8.9	92 U	70	160 J	170 J	92 U		1.9 J	9.4 R	34 J	12	6.4 U	2.1 J	2.5 J	3.0 J	2.5 J	
Endosulfan II	16 J	6.6	140 J	11 U	160	150	220 J		1.8 J	15 J	7.1 J	7.0 U	6.4 U	6.2 U	2.2 J	3.0 J	6.0 U	
4,4'-DDD	4.4 J	22 J	580 J	11 U	230 J	250	92 U		1.8 J	7.8 J	14 J	3.2 J	6.4 U	6.2 U	1.5 J	2.3 J	1.2 J	
Endosulfan sulfate	4.8 U	5.1 U	92 U	11 U	89 U	110 U	92 U		7.7 U	9.4 R	9.3 J	7.0 U	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
4,4'-DDT	1.7 J	1.4 J	92 U	13	12 J	13 J	92 U		7.7 U	4.1 J	1.7 J	4.6 J	6.4 U	6.2 U	4.5 U	1.0 J	6 U	
Methoxychlor	25 U	26 U	170 J	57 U	460 U	570 U	470 U		40 U	49 U	36 R	12 J	33 U	32 U	9.6 J	36 U	31 U	
Endrin ketone	0.81 J	5.1 U	28 J	5.1 J	2.4 J	2.9 J	92 U		0.8 J	6.3 J	1.5 J	1.0 J	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
Endrin aldehyde	4.8 U	5.1 U	31 J	11 U	89 U	110 U	46 J		7.7 U	9.4 R	7.0 R	7.0 U	6.4 U	6.2 U	0.75 J	7.0 U	6.0 U	
gamma-Chlordane	2.5 U	5.6 J	47 U	5.7 U	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	6.4 U	6.2 U	1.6 J	1.1 J	3.1 U	
Aroclor-1242	48 U	51 U	920 U	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Aroclor-1248	46 U	360	920 U	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Inorganics																		
Aluminum	11400	6400	11300	11100	19700	15300	12800	12200	7270	12500	15200	9550	9300	9940	9700	11300	11300	3840
Antimony	9.8 UL	11.9 J	15.6 UJ	10.9 UL	20.1 UL	36.8 J	19.6 J		16.7 J	20.2 J	12.1 UJ	13.1 UL	14.9 UJ	14.1 UJ	11.3 UJ	14.4 J	12.6 UJ	
Arsenic	9.6	8.6	15.5	11.2	18.5	19.1	28.4	23.4	8.2	29.4	16.4 J	12.6 J	10.3	7.4	6.0	9.7	7.7	14.7
Barium	62.5	64.0	286	81.1	249	256	397	380	78.0	380	159	136	88.3	67.1	76.7	69.7	71.8	49.4 B
Beryllium	0.80 J	0.67 J	1.5 J	0.87 J	1.7 J	1.6 J	1.8 J	1.5 B	0.58 J	1.3 J	1.2 J	0.86 J	0.90 J	0.93 J	0.81 J	1.2 J	0.84 J	0.46 B
Cadmium	1.5	0.88	61.4	4.4	45.9	51.8	97.5	91.1	1.4	68.3	6.3	10.8	1.4	1.2 U	1.7	1.2	1.7	
Calcium	54300	73200	60600	58600	46400	45700	50400	51600	104000	69400	45600	76700	75000	69100	79800	67100	81100	1E+05
Chromium	39.4	25.6	534	57.9	465	505	738	698	92.6	561	78.0	142	25.6	25.9	30.3	28.7	31.7	14.8
Cobalt	11.0	6.7	18.9	9.5	19.5	18.9	19.4	18.1 B	7.9	15.6	12.1	11.0	10.0	8.2	9.9	10.4	8.9	4.5 B
Copper	49.4	33.9	429	87.6	402	419	936	697	40.1	1660	137	203	39.6	28.0	46.2	43.6	45.0	28.4
Iron	21000	14200	32900	22600	32200	30500	32300	30400	17500	31200	29200	21700	22200	18700	18800	29700	20100	11900
Lead	272	253	5310	780	2860	2870	3850	5070	127	3340	1040	619 J	38.9	34.3	120	168	95.7	54.6
Magnesium	28400	38100	23400	29900	20200	19800	18300	17300	25800	18400	13200	20500	23500	22700	36800	32100	24300	71100
Manganese	374 J	383 J	379 J	363 J	322 J	328 J	329 J	341	413 J	375 J	341 J	366 J	496 J	410 J	332 J	423 J	478 J	816
Mercury	1.7 J	0.59 J	2.2 J	1.1 J	2.0 J	1.9 J	3.7 J	2.9	0.20 J	3.4 J	3.0 J	1.2 J	0.12 J	0.11 J	0.25 J	1.5 J	0.13 J	0.2
Nickel	27.2	17.3	221	41.4	218	237	206	236	20.9	184	38.1	47.8	28.7	23.4	34.2	31.4	28.5	14.3
Potassium	2550	660	1030	1920	4470	3010	1860	2070 B	1260	1650	2310	1410	1610	2270	1760	2570	2380	597 B
Selenium	0.18 UL	0.19 UL	3.1 J	0.21 UL	1.8 J	2.6 J	1.4 J		0.56 J	1.4 J	2.3 UJ	0.58 J	0.61 J	0.27 UJ	0.50 J	0.20 UL	0.35 J	
Silver	1.4 U	1.4 U	8.3	1.5 U	8.7	9.9	16.9	17.7	2.1 U	11.3	1.7 U	1.8 U	2.1 U	1.9 U	1.6 U	1.5 U	1.8 U	1.5 B
Sodium	285	170 J	433	202 J	585	621	759	576 B	348	551	337	450	300 J	333	233 J	236 J	256 J	342 B
Thallium	0.26 U	0.28 U	0.46	0.31 U	0.57 U	0.66	1.2	1.2 B	0.42 U	0.56	0.34 U	0.37 U	0.42 U	0.40 U	0.32 U	0.30 U	0.36 U	
Vanadium	25.2	17.7	33.2	23.0	47.4	36.1	39.2	32.3	29.7	30.1	30.3	27.9	38.2	40.2	25.9	26.1	27.0	13.2 B
Zinc	173	95.9	1590	257	1510	1660	3350	2960	326	2040	363	566	230	199	207	178	212	140

The volatiles, semi-volatiles and pesticides/pcbs are shown in parts per billion. The inorganics are shown in parts per million.

Table 1

Table 2

I & M Canal Sediment Key Samples

Sampling Location	X261	X201	X202	X203	X204	X205	X206	X207	X208	X209	X210	X211	X212	X213	X214	X215	X216	X217
Date Collected	11-9-99 Bkgd.	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-23-97	9-22-97	9-22-97	9-22-97	9-22-97
Water Depth	2'	14'	8'	14'		19'	13'	7'	7'	7'	7'	7'	7'	7'	7'	6'	6'	6'
Depth in Sediment	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	3'	6'	top 1'	top 1'	4'	top 1'	top 1'	top 1'	top 1'
Volatiles																		
Cyclohexane	20 U																	
Benzene	20 U																	
Methylcyclohexane	20 UJ																	
Toluene	1 J																	
Xylenes (total)	0.5 J																	
Isopropylbenzene	20 U																	
Semi-Volatiles																		
Naphthalene			3400 J	17000 J	2700 J	260000	100 J	11000 J		7100 J	4600 J	2400 J			1800 J	1800 J	770 J	2300 J
2-Methylnaphthalene	20000 U	8000 J	1600 J			18000 J	260 J	9600 J		4200 J	4000 J					1600 J	1900 J	2200 J
Acenaphthylene			3600 J	26000 J		13000 J					4400 J		1200 J		1900 J	2800 J		3600 J
Acenaphthene	20000 U	9000 J	17000	110000	5800	270000		10000 J	160000	30000	16000	10000 J	1600 J	720 J	7500 J	11000	2700 J	5000 J
Dibenzofuran	20000 U	4600 J	2000 J	27000 J	2300 J	120000			110000	9300 J	4900 J			490 J				
Fluorene	20000 U	10000 J	11000	100000	2500	220000		8500 J	240000	35000	17000	11000	1500 J	1000 J	6900 J	11000	2600 J	4100 J
Phenanthrene	610 J	60000	75000 D	280000	6000	800000 D	150 J	54000	1200000 D	210000 D	110000 D	69000	8700	4300	49000 D	94000 D	13000	34000
Anthracene	20000 UJ	13000 J	27000	200000	2200 J	220000		14000 J	190000	63000	35000	21000	5400	1200 J	12000	26000	3600 J	10000 J
Carbazole	20000 UJ					130000												
Di-n-Butylphthalate			3800 JB				90 JB			4000 JB	2700 JB		1500 JB	1400 JB				
Fluoranthene	2200 J	37000	45000 D	460000	21000	610000 D	170 J	34000	660000	200000 D	84000 D	43000	46000 D	4300	32000	27000 D	11000	48000
Pyrene	1400 J	32000	75000 D	300000	16000	240000	360 J	45000	360000	88000	55000 D	60000	16000	3000	61000	39000 D	14000	46000
Benzo(a)anthracene	20000 UJ	25000	42000	210000	8000 J	180000	200 J	16000 J	220000	69000 D	65000	28000	16000	1400 J	19000		5600	29000
Chrysene	20000 UJ	32000	42000	250000	7500	220000	340 J	16000 J	230000	72000 D	73000	28000	17000	1400 J	22000		5800	28000
bis(2-Ethylhexyl)phthalate	20000 UJ				1600 J		380 J											
Benzo(b)fluoranthene	20000 UJ	20000	15000	170000	6000	140000	200 J	7400 J	180000	56000 D	34000	10000 J	14000	680 J	7000 J	15000	2300 J	11000
Benzo(k)fluoranthene	20000 UJ	20000	24000	140000	5300	87000	130 J	13000 J	110000	41000 DJ	37000	14000 J	11000	950 J	7500 J	16000	3300 J	15000
Benzo(a)pyrene	20000 UJ	23000	32000	180000	5700	110000	220 J	18000 J	130000	54000 D	46000	22000	13000	940 J	16000	30000	4400 J	23000
Indeno(1,2,3-cd)pyrene	20000 UJ	14000 J	8500	120000	3400 J	74000	130 J	8200 J	85000 J	29000	22000	7800 J	8500	480 J	9900	10000	2200 J	10000 J
Dibenzo(a,h)anthracene	20000 UJ	5300 J	3200 J	41000 J	1200 J	34000 J	81 J		38000 J	15000	9200 J	3200 J	3000 J			5000	620 J	3300 J
Benzo(g,h,i)perylene	20000 UJ	13000 J	8100	100000	2400 J	55000 J	190 J	11000 J	61000 J	20000	14000	7100 J	6300		8500 J	9400 J	2500 J	9500 J
Pesticides/PCBs																		
alpha-BHC	3.3 U																	
beta-BHC	3.3 U																	
delta-BHC	3.3 U																	
gamma-BHC (Lindane)	3.3 U																	
Heptachlor	3.3 U																	
Aldrin	3.3 U																	
Heptachlor epoxide	3.3 U																	
Endosulfan I	3.3 U																	
Dieldrin	6.5 U																	
4,4'-DDE	27																	
Endrin	6.5 U																	
Endosulfan II	6.5 U																	
[illegible]	13																	
Endosulfan sulfate	6.5 U																	
4,4'-DDT	2.2 J																	
Methoxychlor	33 U																	
Endrin ketone	6.5 U																	
Endrin aldehyde	6.5 U																	
gamma-Chlordane	2.0 J																	
Aroclor-1242	65 U																	
Aroclor-1248	65 U																	
Inorganics																		
Aluminum	9800	6660	8470	1360	1420	3540	4160	7270	8740	9980	8970	7380	3200	9730	9430	8290	8050	7440
Antimony	12.1 UJ																	
Arsenic	8.9 J	24.9	22.1	2.3 B	3.6 B	15.4	2.1 B	14.1 B	22.3	27.5	14.6 B	16.9	6.1	5.1	8.3	9.7	8.8	21.3
Barium	72.5	294	172	33.7 B	26 B	69.7	71.3	115	186	237	176	104	53.2 B	68.4	87	97.7	83	150
Beryllium	0.93 J	0.8 B	0.68 B			0.38 B	0.43 B	0.57 B	0.57 B	0.66 B	0.73 B	0.71 B	0.42 B	0.55 B	0.75 B	0.69 B	0.71 B	0.77 B
Cadmium	1.6	47.9	4.5	3.3	2	8	2.4	2	3.4	4.4	2.7	3	2.4					
Calcium	57000	82900	35200	39000	67900	55200	60100	38700	35400	39800	33900	27100	36800	26100	30800	31900	26800	43400
Chromium	24.6	511	62.1	27.6	16.8	48.4	32.7	39.1	109	186	62.7	33.5	32.5	22	22.9	22.8	19.5	35.1
Cobalt	12.8	11.2 B	10.4 B	3.5 B	5 B	6.3 B	5 B	9.4 B	11 B	11.3 B	11 B	10.2 B	6.7 B	10.3 B	9 B	8.4 B	8.1 B	8.5 B
Copper	44.1	378	163	26.7	69.1	121	47.9	121	182	247	152	96.1	142	41.9	56.5	78.6	53.6	186
Iron	22000	24100	40500	7060	23600	14800	12300	25700	30000	38300	46900	72300	38700	23200	28700	20100	18500	32700
Lead	128	635	352	60	31.2	560	120	272	302	396	241	166	123	146	76.2	92.7	102	282
Magnesium	22400	45000	19400	21200	37900	31000	27200	20400	19300	21200	18400	15000	18000	14900	17600	18000	15000	24100
Manganese	462 J	370	389	152	252	239	301	376	357	411	438	594	355	305	435	406	317	351
Mercury	0.26 J	5	6.7	0.18		1.1	0.27	3.3	6.3	8.5	5.7	4.4	0.52	1.1	1.8	2.6	0.99	3.3
Nickel	26.4	108	25	28.8	34.7	34.1	18.9	25.9	27.2	31.6	22.4	18.2	14.8	24.7	28	24.3	24.6	25.6
Potassium	1480	988 B	1700 B			410 B	529 B	1070 B	1570 B	1850 B	1100 B	927 B		1550 B	1270 B	933 B	1130 B	1410 B
Selenium	0.23 UJ																	
Silver	1.7 U	10.8	4 B					3.3 B	4.7	6.3	2.4 B				2 B	1.9 B	2.1 B	2.6 B
Sodium	372	460 B	444 B	261 B	229 B	327 B	352 B	328 B	303 B	365 B	319 B	318	233 B	267 B	251 B	259 B	208 B	232 B
Thallium	0.34 U	1.2 B							0.55	0.68 B	0.43 B			0.34 B				0.39 B
Vanadium	23.3	17.6 B	22.2	5.6 B	7.6 B	8.2 B	9.8 B	19.2 B	21.1	23.6	23.4	21.8	11.6 B	19.5	21.5	19.5	18.8	20.7
Zinc	212	1940	762	155	148	757	179	467	577	757	554	454	161	167	226	352	209	593

Sampling Location	X218	X219	X220	X221	X222	X223	X224	X225	X226	X227	X242	X228	X243	X229	X230	X244
Date Collected	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-23-97	9-23-97	9-23-97	9-23-97	11-8-99	9-23-97	11-8-99	9-23-97	9-23-97	11-8-99
Water Depth	6"	6"	6"	6"	6"	6"			2'	1'	1.5'			1'	1'	1'
Depth in Sediment	top 1'	4'	7'	top 1'	4'	7'	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 6"	top 1'	top 1'	top 6"
Volatiles																
Cyclohexane											31					1700 J
Benzene											15 U					
Methylcyclohexane											130 J					25000
Toluene											0.9 J		0.7 J			
Xylenes (total)											5 J					400 J
Isopropylbenzene											8 J					400 J
Semi-Volatiles																
Naphthalene			4300 J	26000							1100 J					
2-Methylnaphthalene			1900 J	11000												1800 J
Acenaphthylene			3500 J	3900 J	1600 J	110 J		110 J								
Acenaphthene	4400 J	3500 J	8500	18000	910	630 J	61 J		390 J						1100 J	3500 J
Dibenzofuran			2600 J	1100 J				110 J								2800 J
Fluorene	4700 J	3500 J	7600	10000		110 J		200 J							1500 J	5600 J
Phenanthrene	1600	24000	41000	100000 D	1100 J	420 J	510 J	1900		89 J	2600 J	410 J	3300 J	630 J	1700 J	23000
Anthracene	9000	6700	19000	21000	2100 J	260 J	130 J	340 J				110 J	430 J	2000 J		4400 J
Carbazole								73 J					350 J			
Di-n-Butylphthalate						210 JB	170 JB	66 JB	290 JB	540 B		310 JB		940 JB	1100 JB	
Fluoranthene	23000	28000	120000 D	100000 D	11000	1200	1400	3000	180 J	210 J	1700 J	1400	4500 J	2700 J	6600	9300 J
Pyrene	14000	15000 J	31000	67000 D	12000	960	730	1000	340	170 J	2900 J	740	4300 J	6000	13000	14000 J
Benzo(a)anthracene	9400	11000 J	37000		3900 J	680	360 J	600		83 J	1300 J	440 J	2000 J	1800 J	2700 J	5300 J
Chrysene	12000	12000 J	44000	34000	7000	880	410	710		95 J	1600 J	530 J	1900 J	2800 J	4500 J	8300 J
bis(2-Ethylhexyl)phthalate				38000			330 J	82 J			1200 J	150 J				3100 J
Benzo(b)fluoranthene	6400	10000 J	38000	22000	4100 J	700	360	540		86 J		530 J	2300 J		1500 J	3000 J
Benzo(k)fluoranthene	4900	7200 J	30000	20000	3500 J	750	280 J	460		93 J		570 J	670 J			630 J
Benzo(a)pyrene	5400	11000 J	32000	41000	3600 J	850	330 J	540		87 J	990 J	570 J	1400 J	1600 J	1400 J	3100 J
Indeno(1,2,3-cd)pyrene	2400 J		10000	15000		580	170 J	300 J		76 J		360 J	970 J			1500 J
Dibenzo(a,h)anthracene	960 J		3700 J	3600 J		200 J										
Benzo(g,h,i)perylene	2800 J		7900	15000		580 J		350 J		80 J		350 J	840 J			2700 J
Pesticides/PCBs																
alpha-BHC											2.5 U		2.0 U			2.7 UJ
beta-BHC											0.24 J		2.0 U			2.7 UJ
delta-BHC											0.25 J		2.0 U			2.7 UJ
gamma-BHC (Lindane)											2.5 R		2.0 U			2.7 UJ
Heptachlor											2.5 R		2.0 U			2.7 UJ
Aldrin											2.5 R		2.0 U			2.7 UJ
Heptachlor epoxide											2.5 U		2.0 U			2.2 J
Endosulfan I											2.5 U		0.070 J			1.1 J
Dieldrin											9.1 J		3.8 U			4.6 J
4,4'-DDE											31		0.68 J			30 J
Endrin											25 J		3.8 U			14 J
Endosulfan II											8.9 J		3.8 U			5.2 UJ
[illegible]											6.4 J		1.1 J			8.9 J
Endosulfan sulfate											4.9 U		3.8 U			5.2 UJ
4,4'-DDT											1.0 J		0.27 J			1.6 J
Methoxychlor											25 U		20 U			27 U
Endrin ketone											1.6 J		0.46 J			5.2 UJ
Endrin aldehyde											4.9 U		3.8 U			5.2 UJ
gamma-Chlordane											7.5 J		0.78 J			1.8 J
Aroclor-1242											3700 J		38 U			52 UJ
Aroclor-1248											49 U		38 U			52 UJ
Inorganics																
Aluminum	7680	11400	9140	11100	6940	8560	4130	2710	4740	2610	14400	6540	1710	4710	6250	8770
Antimony											11.2 UJ		10.0 J			10.1 UJ
Arsenic	22.5	30.1	26.5 B	10.2	8.9	9.4	1.1 B	2.9	2.7 B	5	14.0	6.4	9.1	7.6	13.7	11.3
Barium	99.4	321	373	111	111	91	156	63.3	44.5 B	51.4	191	62.5	63.3	53.5 B	72	91.7
Beryllium	0.69 B	0.87 B	0.82 B	0.84 B	0.74 B	0.72 B	0.5 B	0.46 B	0.51 B	0.37 B	2.2	0.59 B	0.34 J	0.86 B	0.61 B	0.74 J
Cadmium	7.2	6.3	5.3		5.8	2.3	1.1				8.5		0.65 U	2.1	2.5	7.0
Calcium	12100	26600	38000	36800	20000	17000	123000	144000	51100	101000	70400	76700	113000	62000	38200	51200
Chromium	174	218	253	30.6	59.2	47.7	11.4	10.8	11	8.8	176	21.5	6.9	63.4	67.8	212
Cobalt	8.5 B	10.5 B	10.2 B	10.2 B	7.9 B	8.3 B	3 B	2.9 B	6.6 B	5.1 B	7.9	7.6 B	3.0	7.7 B	7.9 B	7.0
Copper	375	375	397	105	141	81.1	24.6	19.7	22.1	16.1	146	113	31.4	56.6	97	160
Iron	21300	28200	25700	30000	16600	20300	14600	20300	11400	25200	21100	37400	8750	19500	19800	19200
Lead	554	526	625	245	322	150	31.6	154	91.3	20	735	91.5	41.6 J	167	388	631
Magnesium	7180	14300	18600	20400	11300	9560	70900	74100	29900	54000	31900	35000	62100	31800	15000	25500
Manganese	131	292	329	368	202	491	422	764	260	807	662 J	514	371 J	254	247	292 J
Mercury	2.9	5.6	12.7	3.8	1.2	0.33	0.63		0.48	0.12	1.0 J	0.36	0.070 J	1.4	0.54	4.3 J
Nickel	116	51.2	48.6	31.8	29	30.4	11.2	9.5	15.7	13.2	53.1	22.1	6.6 U	38.4	31.9	59.3
Potassium	799 B	1600 B	1280 B	1500 B	753 B	1240 B	656 B	387 B	837 B	454 B	1370	948 B	346	899 B	815 B	1350
Selenium											0.53 J		1.4 UJ			0.31 J
Silver	2.9 B	9.1	11.7	2.9 B		1.8 B				1.5 B	1.5 U	2.3 B	1.0 U	1.6 B		1.4 U
Sodium	290 B	295 B	318 B	262 B	221 B	302 B	692 B	376 B	216 B	273 B	406	254 B	300	202 B	318 B	265
Thallium		0.8	0.72 B				0.23 B	0.24 B	0.29 B	0.25 B	0.32 U		0.21 UJ			0.29 U
Vanadium	21.6 B	25.4	24.6	23.9	17.5	20.5	8.3 B	7.9 B	12.3 B	12.4	21.2	15.1	7.3	11.1 B	15.6 B	21.2
Zinc	471	1170	1360	471	343	206	82.1	63.2	111	36.4	440	727	71.2	172	210	371

Sampling Location	X245S	X245D	X246	X247	X248	X249	X250	X251	X231	X252	X253	X254	X255	X256	X257	X258	X259	X260	X232
Date Collected	11-9-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	9-23-97	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	9-23-97
Water Depth	1.5'	1.5'	1.5'	1'	1.5'	1.5'	1.5'	1.5'	1'	1.5'	1.5'	6"	6"	1'	1'	2'	2'	2'	2'
Depth in Sediment	1'	7'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 1'	5'	5'	top 6"	top 6"	2'	3'	top 2'	2'
Volatiles																			
Cyclohexane	290	57	1200 J	11000	70000	62000	120000	150000		170	150000	85000	4900	19 U	8 J	50	81 J	1 J	
Benzene	4 J	3 J			2800 J	3200 U	4000 U	4800		23 U	8800	8800	1200 J	19 U	19 U	14 U	21 U	18 U	
Methylcyclohexane	640 J	94 J	12000	55000	250000	230000	480000	580000		140	590000	350000	28000	19 UJ	14 J	170	530 J	0.9 J	
Toluene	5 J	2 J		620 J	12000	1500 J	3300 J	14000		23 U	7300	3400	150 J	0.6 J	19 U	14 U	21 U	0.7 J	
Xylenes (total)	97 J	16		20000 J	140000	50000	95000	250000		10 J	110000	110000	670 J	19 U	2 J	2 J	6 J	18 U	
Isopropylbenzene	64 J	10 J	680 J	2000 J	12000	13000	28000	23000		23 U	49000	21000	1800 J	19 U	19 U	14 U	9 J	18 U	
Semi-Volatiles																			
Naphthalene																			
2-Methylnaphthalene		35000	1500 J	170000	37000	120000	170000	150000	37000	1200 J	55000	220000	40000	510 J	19000 U	790 J	21000 U	18000 U	
Acenaphthylene																			
Acenaphthene		5000 J		13000	5500 J	12000 J	11000 J	20000 J		23000 J	6400 J	23000 J	15000 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Dibenzofuran		5300 J	1200 J	27000	3800 J	23000 J	22000 J	15000 J		23000 U	6600 J	24000 J	8800 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Fluorene		6800 J	1100 J	26000	7300 J	20000 J	25000 J	27000 J		460 J	8200 J	30000 J	16000 J	19000 U	19000 U	370 J	21000 U	18000 U	
Phenanthrene		47000	6300 J	180000	36000	100000	63000	140000	52000	3000 J	34000	140000	78000	2100 J	1500 J	11000 J	21000 U	18000 U	630 J
Anthracene		6500 J		17000	8800	12000	12000 J	21000 J		23000 U	5100 J	24000 J	13000 J	19000 J	19000 U	580 J	21000 U	18000 U	
Carbazole				28000	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 UJ	19000 UJ	1200 J	21000 UJ	18000 UJ	
Di-n-Butylphthalate																			360 JB
Fluoranthene		9700 J	1800 J	46000	11000	14000 J	11000 J	31000 J	10000	4000 J	5900 J	27000 J	9500 J	630 J	520 J	2800 J	470 J	330 J	2700
Pyrene		23000	2600 J	66000	47000	27000	29000 J	58000	10000	4100 J	12000 J	49000 J	34000 J	2900 J	2000 J	4100 J	1100 J	360 J	1400
Benzo(a)anthracene		9700 J	1800 J	19000	9600 J	8400 J	6800 J	14000 J	5700 J	1500 J	2800 J	12000 J	5700 J	1300 J	1000 J	25000 J	21000 U	18000 U	590 J
Chrysene		16000	2700 J	31000	19000 J	16000 J	11000 J	23000 J	1900 J	2700 J	5600 J	19000 J	9500 J	5300 J	3400 J	2500 J	21000 U	18000 U	920 J
bis(2-Ethylhexyl)phthalate		5200 J	1500 J	45000	33000 U	30000 J	20000 U	20000 J	2000 J	20000 U	29000 U	64000 U	21000 U	19000 U	19000 U	14000 U	21000 U	18000 U	980 J
Benzo(b)fluoranthene		6900 J	1500 J	8700	4600 J	3000 J	3900 J	9200 J	1900 J	3200 J	1600 J	64000 U	2600 J	19000 J	19000 U	8300 J	21000 U	18000 U	930 J
Benzo(k)fluoranthene		1700 J	420 J	2000	930 J	1500 J	940 J	2300 J	1500 J	760 J	420 J	1400 J	740 J	19000 U	19000 U	1000 J	21000 U	18000 U	800 J
Benzo(a)pyrene		7600 J	1400 J	8100	5100 J	4700 J	3300 J	8300 J	2800 J	1800 J	1500 J	5600 J	2800 J	1400 J	950 J	7400 J	21000 U	18000 U	840 J
Indeno(1,2,3-cd)pyrene		3300 J	1100 J	3200	2000 J	1700 J	1300 J	3600 J		1800 J	29000 U	64000 U	890 J	19000 U	19000 U	2600 J	21000 U	18000 U	560 J
Dibenzo(a,h)anthracene		4300 J		28000	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	3100 J	21000 U	18000 U	
Benzo(g,h,i)perylene		6200 J	2100 J	8100	6400 J	3900 J	2300 J	6800 J		1800 J	29000 U	64000 U	1900 J	19000 U	19000 U	4600 J	21000 U	18000 U	
Pesticides/PCBs																			
alpha-BHC	2.7 U	2.5 U	2.6 U	47 U	10 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	0.75 J	0.57 J	3.6 U	3.1 U	
beta-BHC	1.6 J	3.1 J	0.81 J	180 J	5.7 U	46 U	57 U	47 U		4.0 U	37 J	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
delta-BHC	2.7 U	2.5 U	2.6 U	57 J	5.7 U	74 J	70 J	130 J		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	1.3 J	2.3 U	3.6 U	3.1 U	
gamma-BHC (Lindane)	2.7 U	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U		4.0 U	19 J	25 J	4.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor	2.7 U	2.5 U	2.6 U	47 U	2.3 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Aldrin	2.7 U	16	2.6 U	380 J	11 J	46 U	57 U	200		4.0 U	4.9 R	3.6 R	7.2 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor epoxide	2.7 U	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U		4.0 U	72 J	27 J	2.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Endosulfan I	1.1 J	2.5 U	2.6 U	47 U	24 J	46 U	57 U	91 J		0.35 J	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Dieldrin	4.4 J	8.9 J	3.5 J	180 J	11 U	100 J	98 J	92 U		7.7 U	9.4 R	7.0 R	2.6 J	1.5 J	6.2 U	4.5 U	7.0 U	3.1 U	
4,4'-DDE	15	73	18	590 J	11 U	270 J	260 J	92 U		2.2 J	56 J	7.0 R	11 J	6.4 U	1.7 J	1.7 J	4.7 J	2.1 J	
Endrin	10 J	45	8.9	92 U	70	160 J	170 J	92 U		1.9 J	9.4 J	34 J	12 J	6.4 U	2.1 J	2.5 J	3.0 J	2.5 J	
Endosulfan II	7.5 J	16	6.6	140 J	11 U	160	150	220 J		1.8 J	15 J	7.1 J	7.0 U	6.4 U	6.2 U	2.2 J	3.0 J	6.0 J	
[illegible]	5.2 J	4.4 J	22 J	580 J	11 U	230 J	250	92 U		1.8 J	7.8 J	14 J	3.2 J	6.4 U	6.2 U	1.5 J	2.3 J	1.2 J	
Endosulfan sulfate	5.2 U	4.8 U	5.1 U	92 U	11 U	89 U	110 U	92 U		7.7 U	9.4 R	9.3 J	7.0 U	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
4,4'-DDT	1.9 J	1.7 J	1.4 J	92 U	13	12 J	13 J	92 U		7.7 U	4.1 J	1.7 J	4.5 J	6.4 U	6.2 U	4.5 U	1.0 J	6 U	
Methoxychlor	27 U	25 U	26 U	170 J	57 U	460 U	570 U	470 U		40 U	49 U	36 R	12 J	33 U	32 U	9.6 J	36 U	31 U	
Endrin ketone	2.3 J	0.61 J	5.1 U	28 J	5.1 J	2.4 J	2.9 J	92 U		0.8 J	8.3 J	1.5 J	1.0 J	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
Endrin aldehyde	1.7 J	4.8 U	5.1 U	31 J	11 U	89 U	110 U	45 J		7.7 U	9.4 R	7.0 R	7.0 U	6.4 U	6.2 U	0.75 J	7.0 U	6.0 U	
gamma-Chlordane	0.65 J	2.5 U	5.8 J	47 U	5.7 U	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	6.4 U	6.2 U	1.6 J	1.1 J	3.1 U	
Aroclor-1242	52 U	48 U	51 U	920 U	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Aroclor-1248	52 U	48 U	360	920 U	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Inorganics																			
Aluminum		11400	6400	11300	11100	19700	15300	12800	12200	7270	12500	15200	9550	9300	9940	9700	11300	11300	3640
Antimony		9.8 U	11.9 J	15.6 UJ	10.9 U	20.1 U	38.8 J	19.8 J		16.7 J	20.2 J	12.1 UJ	13.1 U	14.9 UJ	14.1 UJ	11.3 UJ	14.4 J	12.8 UJ	
Arsenic		9.6	8.6	15.5	11.2	18.5	19.1	28.4	23.4	8.2	29.4	16.4 J	12.6 J	10.3	7.4	6.0	9.7	7.7	14.7
Barium		62.5	64.0	286	81.1	249	256	397	360	78.0	360	159	136	88.3	67.1	75.7	69.7	71.8	49.4 B
Beryllium		0.80 J	0.67 J	1.5 J	0.87 J	1.7 J	1.6 J	1.8 J	1.5 B	0.56 J	1.3 J	1.2 J	0.86 J	0.90 J	0.93 J	0.81 J	1.2 J	0.84 J	0.46 B
Cadmium		1.5	0.88	61.4	4.4	45.9	51.8	97.5	91.1	1.4	66.3	6.3	10.8	1.4	1.2 U	1.7	1.2	1.7	
Calcium		54300	73200	50600	58900	46400	45700	50400	51600	104000	69400	45600	76700	75000	69100	79800	67100	81100	1E+05
Chromium		39.4	25.6	534	57.9	465	505	738	698	92.6	561	78.0	142	25.6	25.9	30.3	28.7	31.7	14.8
Cobalt		11.0	6.7	18.9	9.5	19.5	18.9	19.4	18.1 B	7.9	15.8	12.1	11.0	10.0	8.2	9.9	10.4	8.9	4.5 B
Copper		49.4	33.9	429	87.8	402	419	936	697	40.1	1860	137	203	39.6	28.0	46.2	43.6	45.0	28.4
Iron		21000	14200	32900	22800	32200	30500	32300	30400	17500	31200	29200	21700	22200	18700	18600	23700	20100	11900
Lead		272	253	5310	780	2660	2970	3850	5070	127	3340	1040	619 J	38.9	34.3	120	168	95.7	54.6
Magnesium		28400	36100	23400	29900	20200	19600	18300	17300	25800	18400	13200	20500	23500	22700	36800	32100	24300	71100
Manganese		374 J	383 J	379 J	363 J	322 J	328 J	329 J	341	413 J	375 J	341 J	366 J	496 J	410 J	332 J	423 J	478 J	816
Mercury		1.7 J	0.59 J	2.2 J	1.1 J	2.0 J	1.9 J	3.7 J	2.9	0.20 J	3.4 J	3.0 J	1.2 J	0.12 J	0.11 J	0.25 J	1.5 J	0.13 J	0.2
Nickel		27.2	17.3	221	41.4	218	237	206	236	20.9	184	38.1	47.8	28.7	23.4	34.2	31.4	28.5	14.3
Potassium		2550	680	1030	1920	4470	3010	1880	2070 B	1280	1850	2310	1410	1810	2270	1760	2570	2380	597 B
Selenium		0.18 U	0.19 U	3.1 J	0.21 U	1.8 J	2.6 J	1.4 J		0.56 J	1.4 J	2.3 UJ	0.58 J	0.61 J	0.27 UJ	0.50 J	0.20 U	0.35 J	
Silver		1.4 U	1.4 U	8.3	1.5 U	8.7	9.9	16.8	17.7	2.1 U	11.3	1.7 U	1.8 U	2.1 U	1.9 U	1.6 U	1.5 U	1.8 U	1.5 B
Sodium		295	170 J	433	202 J	595	621	759	576 B	348	551	337	450	300 J	333	233 J	236 J	256 J	342 B
Thallium		0.28 U	0.28 U	0.46	0.31 U	0.57 U	0.66	1.2	1.2 B	0.42 U	0.56	0.34 U	0.37 U	0.42 U	0.40 U	0.32 U	0.30 U	0.36 U	
Vanadium		25.2	17.7	33.2	23.0	47.4	38.1	39.2	32.3	29.7	30.1	30.3	27.9	38.2	40.2	25.9	25.1	27.0	13.2 B
Zinc		173	95.9	1590	257	1510	1680	3350	2980	328	2640	383	586	230	199	207	178	212	140

Analytical results shown in red ink are considered "Key Samples", or samples which are three times or greater above background levels.
The volatiles, semi-volatiles and pesticides/pcbs are shown in parts per billion. The inorganics are shown in parts per million.

I & M Canal Sediment Sample Results Compared to Ecotoxilogical Benchmarks

Sampling Location	Ecotox Bnchmrk	X261	X201	X202	X203	X204	X205	X206	X207	X208	X209	X210
Date Collected		11-9-99 Bkgd.	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97
Water Depth		2'	14'	8'	14'		19'	13'	7'	7'	7'	7'
Depth in Sediment		top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	3'	6'
Volatiles												
[illegible]ane		20 U										
[illegible]	57	21 U										
Methylcyclohexane		20 UJ										
Toluene	670	1 J										
Xylenes (total)	25	0.5 J										
Isopropylbenzene		20 U										
Semi-Volatiles												
Naphthalene	480			3400 J	17000 J	2700 J	260000	100 J	11000 J		7100 J	4600 J
2-Methylnaphthalene		20000 U	8000 J	1600 J			18000 J	260 J	9600 J		4200 J	4000 J
Acenaphthylene				3600 J	26000 J		13000 J					4400 J
Acenaphthene	620	20000 U	8000 J	17000	110000	5800	270000		10000 J	190000	30000	16000
Dibenzofuran	2000	20000 U	4800 J	2000 J	27000 J	2300 J	120000			110000	9300 J	4900 J
Fluorene	540	20000 U	11000 J	11000	100000	2500 J	220000		8500 J	240000	35000	17000
Phenanthrene	850	610 J	64000	75000 D	280000	5000	900000 D	150 J	54000	1200000 D	210000 D	110000 D
Anthracene		20000 UJ	13000 J	27000	200000	2200 J	220000		14000 J	190000	63000	35000
Carbazole		20000 UJ					130000					
Di-n-Butylphthalate	11000			3800 JB				90 JB			4000 JB	2700 JB
Fluoranthene	2900	2200 J	37000	45000 D	480000	21000	810000 D	170 J	34000	660000	200000 D	84000 D
Pyrene	660	1400 J	32000	75000 D	300000	16000	610000 D	360 J	45000	360000	66000	55000 D
Benzo(a)anthracene		20000 UJ	25000	42000	210000	8000 J	180000	200 J	16000 J	220000	69000 D	65000
Chrysene		20000 UJ	32000	42000	250000	7500	220000	340 J	16000 J	230000	72000 D	73000
bis(2-Ethylhexyl)phthalate						1600 J		380 J				
Benzo(b)fluoranthene		20000 UJ	20000	15000	170000	6000	140000	200 J	7400 J	160000	56000 D	34000
Benzo(k)fluoranthene		20000 UJ	20000	24000	140000	5300	87000	130 J	13000 J	110000	41000 DJ	37000
Benzo(a)pyrene	430	20000 UJ	23000	32000	180000	5700	110000	220 J	18000 J	130000	54000 D	46000
Indeno(1,2,3-cd)pyrene		20000 UJ	14000 J	8500	120000	3400 J	74000	130 J	8200 J	85000 J	29000	22000
Dibenzo(a,h)anthracene		20000 UJ	5300 J	3200 J	41000 J	1200 J	34000 J	81 J		38000 J	15000	9200 J
Benzo(g,h,i)perylene		20000 UJ	13000 J	8100	100000	2400 J	55000 J	190 J	11000 J	61000 J	20000	14000
Pesticides/PCBs												
alpha-BHC	6	3.3 U										
beta-BHC	5	3.3 U										
delta-BHC		3.3 U										
gamma-BHC (Lindane)	3.7	3.3 U										
Heptachlor	2	3.3 U										
Aldrin	3	3.3 U										
Heptachlor epoxide		3.3 U										
Endosulfan I	2.9	3.3 U										
Dieldrin	2	6.5 U										
4,4'-DDE		27										
Endrin	3	6.5 U										
Endosulfan II	14	6.5 U										
4,4'-DDD	8	13										
Endosulfan sulfate		6.5 U										
4,4'-DDT	7	2.2 J										
Methoxychlor	19	33 U										
Endrin ketone		6.5 U										
Endrin aldehyde		6.5 U										
gamma-Chlordane	7	2.0 J										
Aroclor-1242		65 U										
Aroclor-1248	30	65 U										
Inorganics												
Aluminum		9800	6660	8470	1360	1420	3540	4160	7270	8740	9980	8970
Antimony		12.1 UJ										
Arsenic	6	8.9 J	24.9	22.1	2.3 B	3.6 B	15.4	2.1 B	14.1 B	22.3	27.5	14.6 B
Barium		72.5	294	172	33.7 B	26 B	69.7	71.3	115	186	237	176
Beryllium		0.93 J	0.8 B	0.68 B			0.38 B	0.43 B	0.57 B	0.57 B	0.66 B	0.73 B
Cadmium	0.6	1.6	47.8	4.5	3.3	2	8	2.4	2	3.4	4.4	2.7
Calcium		57000	82900	35200	39000	67900	55200	60100	38700	35400	39800	33800
Chromium		24.6	511	62.1	27.6	16.8	48.4	32.7	39.1	109	186	62.7
Cobalt	50	12.8	11.2 B	10.4 B	3.5 B	5 B	8.3 B	5 B	9.4 B	11	11.3 B	11
Copper	16	44.1	378	163	26.7	69.1	121	47.9	121	182	247	152
Iron	20000	22000	24100	40500	7060	23600	14800	12300	25700	30000	38300	46900
Lead	31	128	635	352	60	31.2	560	120	273	302	396	241
Magnesium		22400	45000	19400	21200	37900	31000	27200	20400	19300	21200	18400
Manganese	460	462 J	370	389	152	252	239	301	376	357	411	438
Mercury	0.2	0.26 J	5	6.7	0.18		1.1	0.27	3.3	6.3	8.5	5.7
Nickel	16	26.4	108	25	28.8	34.7	34.1	18.9	25.9	27.2	31.8	22.4
Potassium		1480	988 B	1700 B			410 B	529 B	1070 B	1570 B	1850 B	1100 B
Selenium		0.23 UJ										
Silver	0.5	1.7 U	10.8						3.3 B	4.7	6.3	2.4
Sodium		372	460 B	444 B	261 B	229 B	327 B	352 B	328 B	303 B	365 B	319 B
Thallium		0.34 U	1.2 B	B						0.55 B	0.68 B	0.43 B
Vanadium		23.3	17.6 B	22.2 B	5.6 B	7.6 B	8.2 B	9.8 B	19.2 B	21.1	23.6	23.4
Zinc	120	212	1940	762	155	148	757	179	487	577	554	454

Sampling Location	X211	X212	X213	X214	X215	X216	X217	X218	X219	X220	X221
Date Collected	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97
Water Depth	7'	7'	7'	7'	6'	6'	6"	6"	6"	6"	6"
Depth in Sediment	top 1'	top 1'	4'	top 1'	top 1'	top 1'	top 1'	top 1'	4'	7'	top 1'
Semi-Volatiles											
Naphthalene	2400 J			1800 J	1800 J	770 J	2300 J			4300 J	26000
2-Methylnaphthalene					1600 J	1900 J	2200 J			1900 J	11000
Acenaphthylene		1200 J		1900 J	2800 J		3600 J			3500 J	3900 J
Acenaphthene	10000 J	1600 J	720 J	7500 J	11000	2700 J	5000 J	4400 J	3500 J	8500	18000
Dibenzofuran			490 J							2600 J	1100 J
Fluorene	11000	1500 J	1000 J	6900 J	11000 J	2800 J	4100 J	4700 J	3500 J	7600	10000
Phenanthrene	69000	8700	4300	46000 D	94000 D	13000	34000	1600 J	24000	41000 D	100000 D
Anthracene	21000	5400	1200 J	12000	26000	3600 J	10000 J	9000	6700 J	19000	21000
Di-n-Butylphthalate		1500 JB	1400 JB								
Fluoranthene	43000	48000 D	4300	32000	27000 D	11000	48000	23000	28000	120000 D	100000 D
Pyrene	43000	16000	3000	61000	39000 D	14000	46000	14000	15000 J	31000	57000 D
Benzo(a)anthracene	28000	16000	1400 J	19000		5600	29000	9400	11000 J	37000	
Chrysene	28000	17000	1400 J	22000		5800	28000	12000	12000 J	44000	34000
bis(2-Ethylhexyl)phthalate											38000
Benzo(b)fluoranthene	10000 J	14000	680 J	7000 J	15000	2300 J	11000	8400	10000 J	38000	22000
Benzo(k)fluoranthene	14000	11000	950 J	7500 J	16000	3300 J	15000	4900	7200 J	30000	20000
Benzo(a)pyrene	22000	13000	940 J	16000	30000	4400 J	23000	5400	11000 J	32000	41000
Indeno(1,2,3-cd)pyrene	7800 J	8500	480 J	9900	10000	2200 J	10000 J	2400 J		10000	15000
Dibenzo(a,h)anthracene	3200 J	3000 J			5000 J	620 J	3300 J	960 J		3700 J	3600 J
Benzo(g,h,i)perylene	7100 J	6300		8500 J	9400 J	2500 J	9600 J	2800 J		7900	15000
Inorganics											
Aluminum	7380	3200	9730	9430	8290	8050	7440	7680	11400	9140	11100
Arsenic	18.9	6.1	5.1	8.3	9.7	8.8	21.3	22.5	30.1	26.5 B	10.2
Barium	104	53.2 B	68.4	87	97.7	83	150	99.4	321	373	111
Beryllium	0.71 B	0.42 B	0.55 B	0.75 B	0.69 B	0.71 B	0.77 B	0.69 B	0.87 B	0.82 B	0.84 B
Cadmium	3	2.4						7.2	8.3	5.3	
Calcium	27100	36800	26100	30800	31900	26800	43400	12100	26600	38000	36800
Chromium	33.5	32.5	22	22.9	22.8	19.5	35.1	174	218	253	30.6
Cobalt	10.2 B	6.7 B	10.3 B	9 B	8.4 B	8.1 B	8.5 B	8.5 B	10.5 B	10.2 B	10.2 B
Copper	98.1	142	41.9	56.5	78.6	53.6	186	375	375	397	105
Iron	73300	38700	23200	28700	20100	18500	32700	21300	28200	25700	30000
Lead	166	123	148	76.2	82.7	102	282	554	526	625	245
Magnesium	15000	15000	14900	17600	18000	15000	24100	7180	14300	18600	20400
Manganese	594	355	305	435	406	317	351	131	292	329	368
Mercury	4.4	0.52	1.1	1.8	2.6	0.99	3.3	2.9	5.6	12.7	3.8
Nickel	18.2	14.6	24.7	18	24.3	24.8	25.6	116	51.2	48.6	31.8
Potassium	927 B		1550 B	1270 B	933 B	1130 B	1410 B	790 B	1600 B	1280 B	1500 B
Silver					1.9 B	2.1 B	2.6 B	2.9 B	9.1 B	11.7	2.9 B
Sodium	318 B	233	267 B	251 B	259 B	208 B	232 B	290 B	295 B	318 B	262 B
Thallium			0.34 B				0.39 B		0.8 B	0.72 B	
Vanadium	21.8	11.6 B	19.5	21.5	19.5	18.8	20.7	21.6 B	25.4	24.6	23.9
Zinc	454	181	167	226	352	209	593	471	1170	1360	471

Sampling Location	X222	X223	X224	X225	X226	X227	X242	X228	X243	X229	X230
Date Collected	9-22-97	9-22-97	9-23-97	9-23-97	9-23-97	9-23-97	11-8-99	9-23-97	11-8-99	9-23-97	9-23-97
Water Depth	6"	6"			2'	1'	1.5'			1'	1'
Depth in Sediment	4'	7'	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 6"	top 1'	top 1'
Volatiles											
[illegible]ane							31				
[illegible]							15 U				
Methylcyclohexane							130 J				
Toluene							0.9 J		0.7 J		
Xylenes (total)							5 J				
Isopropylbenzene							8 J				
Semi-Volatiles											
Naphthalene							1100 J				
Acenaphthylene	1600 J	110 J		110 J							
Acenaphthene	910 J	630 J	61 J		390 J						1100 J
Dibenzofuran				110 J							
Fluorene		110 J		200 J							1500 J
Phenanthrene	1100 J	420 J	510 J	1900		89 J	2800 J	410 J	3300 J	630 J	1700 J
Anthracene	2100 J	260 J	130 J	340 J				110 J	430 J	2000 J	
Carbazole				73 J					350 J		
Di-n-Butylphthalate		210 JB	170 JB	66 JB	290 JB	540 B		310 JB		940 JB	1100 JB
Fluoranthene	11000	1200	1400	3000	180 J	210 J	1700 J	1400	4500 J	2700 J	6600
Pyrene	12000	960	730	1000	340 J	170 J	2900 J	740	4300 J	6000	13000
Benzo(a)anthracene	3900 J	680	360 J	600		83 J	1300 J	440 J	2000 J	1800 J	2700 J
Chrysene	7000	880	410	710		95 J	1600 J	530 J	1900 J	2800 J	4500 J
bis(2-Ethylhexyl)phthalate			330 J	82 J			1200 J	150 J			
Benzo(b)fluoranthene	4100 J	700	360 J	540		86 J		530 J	2300 J		1500 J
Benzo(k)fluoranthene	3500 J	750	280 J	460		93 J		570 J	670 J		
Benzo(a)pyrene	3600 J	850	330 J	540		87 J	990 J	570 J	1400 J	1600 J	1400 J
Indeno(1,2,3-cd)pyrene		580 J	170 J	300 J		76 J		360 J	970 J		
Dibenzo(a,h)anthracene		200 J									
Benzo(g,h,i)perylene		580 J		350 J		80 J		350 J	840 J		
Pesticides/PCBs											
alpha-BHC							2.5 U		2.0 U		
beta-BHC							0.24 J		2.0 U		
delta-BHC							0.25 J		2.0 U		
gamma-BHC (Lindane)							2.5 R		2.0 U		
Heptachlor							2.5 R		2.0 U		
Aldrin							2.5 R		2.0 U		
Heptachlor epoxide							2.5 U		2.0 U		
Endosulfan I							2.5 U		0.070 J		
Dieldrin							9.1 J		3.8 U		
4,4'-DDE							31		0.68 J		
Endrin							25 J		3.8 U		
Endosulfan II							8.9 J		3.8 U		
4,4'-DDD							6.4 J		1.1 J		
Endosulfan sulfate							4.9 U		3.8 U		
4,4'-DDT							1.0 J		0.27 J		
Methoxychlor							25 U		20 U		
Endrin ketone							1.6 J		0.46 J		
Endrin aldehyde							4.9 U		3.8 U		
gamma-Chlordane							7.5 J		0.78 J		
Aroclor-1242							3700 J		38 U		
Aroclor-1248							49 U		38 U		
Inorganics											
Aluminum	6940	8560	4130	2710	4740	2610	14400	6540	1710	4710	6250
Antimony							11.2 UJ		10.0 J		
Arsenic	8.9	9.4	1.1 B	2.9	2.7 B	5	14.0	6.4	9.1	7.6	13.7
Barium	111	91	156	63.3	44.5 B	51.4	191	62.5	63.3	53.5 B	72
Beryllium	0.74 B	0.72 B	0.5 B	0.46 B	0.51 B	0.37 B	2.2	0.59 B	0.34 J	0.86 B	0.61 B
Cadmium	5.8	2.3	1.1				8.5		0.65 U	2.1	2.5
Calcium	20000	17000	123000	144000	51100	101000	70400	76700	113000	62000	38200
Chromium	59.2	47.7	11.4	10.8	11	8.8	176	21.5	6.9	63.4	67.8
Cobalt	7.9 B	8.3 B	3 B	2.9 B	6.6 B	5.1 B	7.9	7.6 B	3.0	7.7 B	7.9 B
Copper	141	81.1	24.6	19.7	22.1	16.1	146	113	31.4	56.6	97
Iron	16600	20300	14600	20300	11400	25200	21100	37400	8750	19500	19800
Lead	322	150	31.6	154	91.3	20	735	91.5	41.6 J	167	388
Magnesium	11300	9560	70900	74100	29900	54000	31900	35000	62100	31800	15000
Manganese	202	491	422	784	260	807	662 J	514	371 J	254	247
Mercury	1.2	0.33	0.63		0.48	0.12	1.0 J	0.36	0.070 J	1.4	0.54
Nickel	29	30.4	11.2	9.5	15.7	13.2	53.1	22.1	6.6 U	38.4	31.9
Potassium	753 B	1240 B	656 B	387 B	837 B	454 B	1370	948 B	346	899 B	815 B
Selenium							0.53 J		1.4 UJ		
Silver		1.8 B				1.5 B	1.5 U	2.3 B	1.0 U	1.6 B	
Sodium	221 B	302 B	692 B	376 B	216 B	273 B	406	254 B	300	202 B	318 B
Thallium			0.23 B	0.24 B	0.29 B	0.25 B	0.32 U		0.21 UJ		
Vanadium	17.5	20.5	8.3 B	7.9 B	12.3 B	12.4	21.2	15.1	7.3	11.1 B	15.6 B
Zinc	343	206	82.1	63.2	111	36.4	440	727	71.2	172	210

Sampling Location	X244	X245S	X245D	X246	X247	X248	X249	X250	X251	X231
Date Collected	11-8-99	11-9-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	11-8-99	9-23-97
Water Depth	1'	1.5'	1.5'	1.5'	1'	1.5'	1.5'	1.5'	1.5'	1'
Depth in Sediment	top 6"	1'	7'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	2'
Volatiles										
[illegible]ane	1700 J	290	57	1200 J	11000	70000	62000	120000	150000	
[illegible]		4 J	3 J			2800 J	3200 U	4000 U	4800	
Methylcyclohexane	25000	640 J	94 J	12000	55000	250000	230000	480000	580000	
Toluene		5 J	2 J		620 J	12000	1500 J	3300 J	14000	
Xylenes (total)	400 J	97 J	16		20000 J	140000	50000	95000	250000	
Isopropylbenzene	400 J	64 J	10 J	680 J	2000 J	12000	13000	28000	23000	
Semi-Volatiles										
2-Methylnaphthalene	1800 J		35000	1500 J	170000	37000	120000	170000	150000	37000
Acenaphthene	3500 J		5000 J		13000	5500 J	12000 J	11000 J	20000 J	
Dibenzofuran	2800 J		5300 J	1200 J	27000	3800 J	23000 J	22000 J	15000 J	
Fluorene	5600 J		6800 J	1100 J	26000	7300 J	20000 J	25000 J	27000 J	
Phenanthrene	23000		47000	6300 J	180000	36000	100000	83000	140000	52000
Anthracene	4400 J		6500 J		17000	8800 J	12000 J	12000 J	21000 J	
Carbazole					28000	33000 U	27000 U	33000 U	28000 U	
Fluoranthene	9300 J		9700 J	1800 J	46000	11000 J	14000 J	11000 J	31000	10000
Pyrene	14000 J		23000	2600 J	66000	47000	27000	29000 J	58000	10000
Benzo(a)anthracene	5300 J		9700 J	1800 J	19000	9600 J	8400 J	6800 J	14000 J	5700 J
Chrysene	8300 J		16000	2700 J	31000	19000 J	16000 J	11000 J	23000 J	7900
bis(2-Ethylhexyl)phthalate	3100 J		5200 J	1500 J	45000	33000 U	30000	29000 J	20000 J	20000
Benzo(b)fluoranthene	3000 J		6900 J	1500 K	8700	4600 J	4900 J	3900 J	9200 J	1900 J
Benzo(k)fluoranthene	630 J		1700 J	420 J	2000	930 J	1500 J	940 J	2300 J	1500 J
Benzo(a)pyrene	3100 J		7600 J	1400 J	8100	5100 J	4700 J	3300 J	8300 J	2800 J
Indeno(1,2,3-cd)pyrene	1500 J		3300 J	1100 J	3200	2000 J	1700 J	1300 J	3600 J	
Dibenzo(a,h)anthracene			4300 J		28000	33000 U	27000 U	33000 U	28000 U	
Benzo(g,h,i)perylene	2700 J		6200 J	2100 J	8100	6400 J	3900 J	2300 J	6800 J	
Pesticides/PCBs										
alpha-BHC	2.7 UL	2.7 U	2.5 U	2.6 U	47 U	10 J	46 U	57 U	47 U	
beta-BHC	2.7 UL	1.6 J	3.1 J	0.81 J	180 J	5.7 U	46 U	57 U	47 U	
delta-BHC	2.7 UL	2.7 U	2.5 U	2.6 U	57 J	5.7 U	74 J	70 J	130 J	
gamma-BHC (Lindane)	2.7 UL	2.7 U	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U	
Heptachlor	2.7 UL	2.7 U	2.5 U	2.6 U	47 U	2.3 J	46 U	57 U	47 U	
Aldrin	2.7 UL	2.7 U	16 J	2.6 U	380 J	11 J	46 U	57 U	200	
Heptachlor epoxide	2.2 J	2.7 U	2.5 U	2.6 U	47 U	5.7 U	46 U	57 U	47 U	
Endosulfan I	1.1 J	1.1 J	2.5 U	2.6 U	47 U	24 J	46 U	57 U	91 J	
Dieldrin	4.6 J	4.4 J	8.9 J	3.5 J	180 J	11 U	100 J	98 J	92 U	
4,4'-DDE	30 J	15	73	18	590 J	11 U	270 J	260 J	92 U	
Endrin	14 J	10 J	45	8.9	92 U	70	160 J	170 J	92 U	
Endosulfan II	5.2 UL	7.5 J	16 J	6.6	140 J	11 U	160	150	220 J	
4,4'-DDD	8.9 J	5.2 J	4.4 J	22 J	580 J	11 U	230 J	250	92 U	
Endosulfan sulfate	5.2 UL	5.2 U	4.8 U	5.1 U	92 U	11 U	89 U	110 U	92 U	
4,4'-DDT	1.6 J	1.9 J	1.7 J	1.4 J	92 U	13	12 J	13 J	92 U	
Methoxychlor	27 U	27 U	25 U	26 U	170 J	57 U	460 U	570 U	470 U	
Endrin ketone	5.2 UL	2.3 J	0.61 J	5.1 U	28 J	5.1 J	2.4 J	2.9 J	92 U	
Endrin aldehyde	5.2 UL	1.7 J	4.8 U	5.1 U	31 J	11 U	89 U	110 U	45 J	
gamma-Chlordane	1.8 J	0.65 J	2.5 U	5.8 J	47 U	5.7 U	46 U	57 U	47 U	
Aroclor-1242	52 UL	52 U	48 U	51 U	920 U	110 U	890 U	1100 U	920 U	
Aroclor-1248	52 UL	52 U	48 U	360	920 U	110 U	890 U	1100 U	920 U	
Inorganics										
Aluminum	8770		11400	6400	11300	11100	19700	15300	12800	12200
Antimony	10.1 UJ		9.8 UL	11.9 J	15.6 UJ	10.9 UL	20.1 UL	38.8 J	19.8 J	
Arsenic	11.3		9.6	8.6	15.5	11.2	18.5	19.1	28.4	23.4
Barium	91.7		62.5	64.0	286	81.1	249	256	397	360
Beryllium	0.74 J		0.80 J	0.67 J	1.5 J	0.87 J	1.7 J	1.6 J	1.8 J	1.5 B
Cadmium	7.0		1.5	0.88	61.4	4.4	45.9	51.8	97.5	91.1
Calcium	51200		54300	73200	50600	58900	46400	45700	50400	51600
Chromium	212		39.4	25.6	534	57.9	465	505	738	698
Cobalt	7.0		11.0	6.7	18.9	9.5	19.5	18.9	19.4	18.1 B
Copper	160		49.4	33.9	429	87.8	402	419	936	697
Iron	19200		21000	14200	32900	22800	32200	30500	32300	30400
Lead	631		272	253	5310	780	2660	2970	3850	5070
Magnesium	25500		28400	36100	23400	29900	20200	19600	18300	17300
Manganese	292 J		374 J	383 J	379 J	363 J	322 J	328 J	329 J	341
Mercury	4.3 J		1.7 J	0.59 J	2.2 J	1.1 J	2.0 J	1.9 J	3.7 J	2.9
Nickel	59.3		27.2	17.3	221	41.4	218	237	206	236
Potassium	1350		2550	680	1030	1920	4470	3010	1880	2070 B
Selenium	0.31 J		0.18 UL	0.19 UL	3.1 J	0.21 UL	1.8 J	2.6 J	1.4 J	
Silver	1.4 U		1.4 U	1.4 U	8.3	1.5 U	8.7	9.9	16.8	17.7
Sodium	265		295	170 J	433	202 J	595	621	759	576 B
Thallium	0.29 U		0.28 U	0.28 U	0.46	0.31 U	0.57 U	0.66	1.2	1.2 B
Vanadium	21.2		25.2	17.7	33.2	23.0	47.4	38.1	39.2	32.3
Zinc	371		173	95.9	1590	257	1510	1680	3350	2980

Sampling Location	X252	X253	X254	X255	X256	X257	X258	X259	X260	X232
Date Collected	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	9-23-97
Water Depth	1.5'	1.5'	6"	6"	1'	1'	2'	2'	2'	2'
Depth in Sediment	top 1'	top 1'	5'	5'	top 6"	top 6"	2'	3'	top 2'	2'
Volatiles										
[illegible]ane	170	150000	85000	4900	19 U	8 J	50	81 J	1 J	
[illegible]	23 U	8800	8800	1200 J	19 U	19 U	14 U	21 U	18 U	
Methylcyclohexane	140	590000	350000	28000	19 UJ	14 J	170	530 J	0.9 J	
Toluene	23 U	7300	3400	150 J	0.6 J	19 U	14 U	21 U	0.7 J	
Xylenes (total)	10 J	110000	110000	670 J	19 U	2 J	2 J	6 J	18 U	
Isopropylbenzene	23 U	49000	21000	1800 J	19 U	19 U	14 U	9 J	18 U	
Semi-Volatiles										
2-Methylnaphthalene	1200 J	55000	220000	40000	510 J	19000 U	790 J	21000 U	18000 U	
Acenaphthene	23000 U	6400 J	23000 J	15000 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Dibenzofuran	23000 U	6600 J	24000 J	8800 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Fluorene	460 J	8200 J	30000 J	16000 J	19000 U	19000 U	370 J	21000 U	18000 U	
Phenanthrene	3000 J	34000	140000	78000	2100 J	1500 J	11000 J	21000 U	18000 U	630 J
Anthracene	23000 U	5100 J	24000 J	13000 J	19000 U	19000 U	580 J	21000 U	18000 U	
Carbazole	23000 U	29000 U	64000 U	21000 U	19000 UJ	19000 UJ	1200 J	21000 UJ	18000 UJ	
Di-n-Butylphthalate										360 JB
Fluoranthene	4000 J	5900 J	27000 J	9500 J	630 J	520 J	2800 J	470 J	330 J	2700
Pyrene	4100 J	12000 J	49000 J	34000	2900 J	2000 J	14000 J	1100 J	360 J	1400
Benzo(a)anthracene	1500 J	2800 J	12000 J	5700 J	1300 J	1000 J	25000	21000 U	18000 U	590 J
Chrysene	2700 J	5600 J	19000 J	9500 J	5300 J	3400 J	27000	21000 U	18000 U	920 J
bis(2-Ethylhexyl)phthalate	23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	14000 U	21000 U	18000 U	960 J
Benzo(b)fluoranthene	3200 J	1600 J	6600 J	2600 J	19000 U	19000 U	8300 J	21000 U	18000 U	930 J
Benzo(k)fluoranthene	760 J	420 J	1400 J	740 J	19000 U	19000 U	1000 J	21000 U	18000 U	800 J
Benzo(a)pyrene	1800 J	1500 J	5600 J	2800 J	1400 J	950 J	7400 J	21000 U	18000 U	840 J
Indeno(1,2,3-cd)pyrene	1800 J	29000 U	64000 U	890 J	19000 U	19000 U	2600 J	21000 U	18000 U	560 J
Dibenzo(a,h)anthracene	23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	3100 J	21000 U	18000 U	
Benzo(g,h,i)perylene	1800 J	29000 U	64000 U	1900 J	19000 U	19000 U	4600 J	21000 U	18000 U	
Pesticides/PCBs										
alpha-BHC	4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	0.75 J	0.57 J	3.6 U	3.1 U	
beta-BHC	4.0 U	37 J	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
delta-BHC	4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	1.3 J	2.3 U	3.6 U	3.1 U	
gamma-BHC (Lindane)	4.0 U	19 J	25 J	4.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor	4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Aldrin	4.0 U	4.9 R	3.6 R	7.2 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor epoxide	4.0 U	72 J	27 J	2.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Endosulfan I	0.35 J	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Dieldrin	7.7 U	9.4 R	7.0 R	2.6 J	1.5 J	6.2 U	4.5 U	7.0 U	3.1 U	
4,4'-DDE	2.2 J	56 J	7.0 R	11 J	6.4 U	1.7 J	1.7 J	4.7 J	2.1 J	
Endrin	1.9 J	9.4 R	34 J	12	6.4 U	2.1 J	2.5 J	3.0 J	2.5 J	
Endosulfan II	1.8 J	15 J	7.1 J	7.0 U	6.4 U	6.2 U	2.2 J	3.0 J	6.0 U	
4,4'-DDD	1.8 J	7.8 J	14 J	3.2 J	6.4 U	6.2 U	1.5 J	2.3 J	1.2 J	
Endosulfan sulfate	7.7 U	9.4 R	9.3 J	7.0 U	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
4,4'-DDT	7.7 U	4.1 J	1.7 J	4.5 J	6.4 U	6.2 U	4.5 U	1.0 J	6 U	
Methoxychlor	40 U	49 U	36 R	12 J	33 U	32 U	9.6 J	36 U	31 U	
Endrin ketone	0.8 J	8.3 J	1.5 J	1.0 J	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
Endrin aldehyde	7.7 U	9.4 R	7.0 R	7.0 U	6.4 U	6.2 U	0.75 J	7.0 U	6.0 U	
gamma-Chlordane	4.0 U	4.9 R	3.6 R	3.6 U	6.4 U	6.2 U	1.6 J	1.1 J	3.1 U	
Aroclor-1242	77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Aroclor-1248	77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Inorganics										
Aluminum	7270	12500	15200	9550	9300	9940	9700	11300	11300	3640
Antimony	16.7 J	20.2 J	12.1 UJ	13.1 UL	14.9 UJ	14.1 UJ	11.3 UJ	14.4 J	12.8 UJ	
Arsenic	8.2	29.4	16.4 J	12.6 J	10.3	7.4	6.0	9.7	7.7	14.7
Barium	78.0	360	159	136	88.3	67.1	75.7	69.7	71.8	49.4 B
Beryllium	0.56 J	1.3 J	1.2 J	0.86 J	0.90 J	0.93 J	0.81 J	1.2 J	0.84 J	0.46 B
Cadmium	1.4	66.3	6.3	10.8	1.4	1.2 U	1.7	1.2	1.7	
Calcium	104000	69400	45600	76700	75000	69100	79800	67100	81100	1E+05
Chromium	92.6	561	78.0	142	25.6	25.9	30.3	28.7	31.7	14.8
Cobalt	7.9	15.8	12.1	11.0	10.0	8.2	9.9	10.4	8.9	4.5 B
Copper	40.1	1860	137	203	39.6	28.0	46.2	43.6	45.0	28.4
Iron	17500	31200	29200	21700	22200	18700	18600	23700	20100	11900
Lead	127	3340	1040	619 J	38.9	34.3	120	168	95.7	54.6
Magnesium	25800	18400	13200	20500	23500	22700	36800	32100	24300	71100
Manganese	413 J	375 J	341 J	366 J	496 J	410 J	332 J	423 J	478 J	816
Mercury	0.20 J	3.4 J	3.0 J	1.2 J	0.12 J	0.11 J	0.25 J	1.5 J	0.13 J	0.2
Nickel	20.9	184	38.1	47.8	28.7	23.4	34.2	31.4	28.5	14.3
Potassium	1280	1850	2310	1410	1810	2270	1760	2570	2380	597 B
Selenium	0.56 J	1.4 J	2.3 UJ	0.58 J	0.61 J	0.27 UJ	0.50 J	0.20 UL	0.35 J	
Silver	2.1 U	11.3	1.7 U	1.8 U	2.1 U	1.9 U	1.6 U	1.5 U	1.8 U	1.5 B
Sodium	348	551	337	450	300 J	333	233 J	236 J	256 J	342 B
Thallium	0.42 U	0.56	0.34 U	0.37 U	0.42 U	0.40 U	0.32 U	0.30 U	0.36 U	
Vanadium	29.7	30.1	30.3	27.9	38.2	40.2	25.9	25.1	27.0	13.2 B
Zinc	328	2640	383	586	230	199	207	178	212	140

Results shown in red exceed the ecotoxilogical benchmarks.

The volatiles, semi-volatiles and pesticides/pcbs are shown in parts per billion. The inorganics are shown in parts per million.

Table 3

Table 4

I & M Canal Sediment Sample Results Compared to SCDM Soil Screening Benchmarks

Sampling Location	SCDM Soil Bnchmrk. Bkgd.	X261	X201	X202	X203	X204	X205	X206	X207	X208	X209	X210	X211	X212	X213
Date Collected		11-9-99	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97
Water Depth		2'	14'	8'	14'		19'	13'	7'	7'	7'	7'	7'	7'	7'
Depth in Sediment		top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	top 1'	3'	5'	7'	7'	4'
Volatiles															
[illegible]exane		20 U													
Benzene	20000	20 U													
Methylcyclohexane		20 UJ													
Toluene	120000000	1 J													
Xylenes (total)		0.5 J													
Isopropylbenzene		20 U													
Semi-Volatiles															
Naphthalene				3400 J	17000 J	2700 J	260000	100 J	11000 J		7100 J	4600 J	2400 J		
2-Methylnaphthalene		20000 U	8000 J	1600 J			16000 J	260 J	9600 J		4200 J	4000 J			
Acenaphthylene				3600 J	26000 J		13000 J				4400 J			1200 J	
Acenaphthene	35000000	20000 U	9000 J	17000	110000	5800	270000		10000 J	190000	30000	16000	10000 J	1600 J	720 J
Dibenzofuran		20000 U	4600 J	2000 J	27000 J	2300 J	120000			110000	9300 J	4900 J			490 J
Fluorene	23000000	20000 U	10000 J	11000	100000	2500 J	220000		8500 J	240000	35000	17000	11000	1500 J	1000 J
Phenanthrene		610 J	60000	75000 D	280000	5000	900000 D	150 J	54000	1200000 D	210000 D	110000 D	69000	8700	4300
Anthracene	170000000	20000 UJ	13000 J	27000	200000	2200 J	220000		14000 J	190000	63000	35000	21000	5400	1200 J
Carbazole		20000 UJ					130000								
Di-n-Butylphthalate	58000000			3800 JB				90 JB			4000 JB	2700 JB		1500 JB	1400 JB
Fluoranthene		2200 J	37000	45000 D	460000	21000	610000 D	170 J	34000	660000	200000 D	84000 D	43000	46000 D	4100
Pyrene	17000000	1400 J	32000	75000 D	300000	16000	240000	360 J	45000	360000	66000	55000 D	60000	16000	3000
Benzo(a)anthracene		20000 UJ	25000	42000	210000	8000	180000	200 J	16000 J	220000	69000 D	65000	28000	16000	1400 J
Chrysene		20000 UJ	32000	42000	250000	7500	220000	340 J	16000 J	230000	72000 D	73000	28000	17000	1400 J
bis(2-Ethylhexyl)phthalate	42000	20000 UJ													
Benzo(b)fluoranthene		20000 UJ	20000	15000	170000	6000	140000	200 J	7400 J	160000	56000 D	34000	10000 J	14000	680 J
Benzo(k)fluoranthene		20000 UJ	20000	24000	140000	5300	87000	130 J	13000 J	110000	41000 DJ	37000	14000	11000	950 J
Benzo(a)pyrene	80	20000 UJ	23000	32000	180000	5700	110000	220 J	18000 J	130000	54000 D	46000	22000	13000	940 J
Indeno(1,2,3-cd)pyrene		20000 UJ	14000 J	8500	120000	3400 J	74000	130 J	8200 J	85000 J	29000	22000	7800 J	8500	480 J
Dibenzo(a,h)anthracene		20000 UJ	5300 J	3200 J	41000 J	1200 J	34000 J	81 J		38000 J	15000	9200 J	3200 J	3000 J	
Benzo(g,h,i)perylene		20000 UJ	13000 J	8100	100000	2400 J	55000 J	190 J	11000 J	61000 J	20000	14000	7100 J	6300	
Pesticides/PCBs															
alpha-BHC		3.3 U													
beta-BHC		3.3 U													
delta-BHC		3.3 U													
gamma-BHC (Lindane)	450	3.3 U													
Heptachlor	130	3.3 U													
Aldrin	34	3.3 U													
Heptachlor epoxide	64	3.3 U													
Endosulfan I	3500000	3.3 U													
Dieldrin	36	6.5 U													
4,4'-DDE	1700	27													
Endrin	170000	6.5 U													
Endosulfan II	3500000	6.5 U													
4,4'-DDD	1400	13													
Endosulfan sulfate		6.5 U													
4,4'-DDT	1400	2.2 J													
Methoxychlor	2900000	33 U													
Endrin ketone		6.5 U													
Endrin aldehyde		6.5 U													
gamma-Chlordane		2.0 J													
Aroclor-1242	76	65 U													
Aroclor-1248	76	65 U													
Inorganics															
Aluminum		9800	6660	8470	1360	1420	3540	4160	7270	8740	9980	8970	7380	3200	9730
Antimony	230	12.1 UJ													
Arsenic	.33	8.9 J	24.9	22.1	2.3 B	3.6 B	15.4	2.1 B	14.1 B	22.3	27.5	14.6 B	16.9	6.1	5.1
Barium	41000	72.5	294	172	33.7 B	26 B	69.7	71.3	115	186	237	176	104	53.2 B	68.4
Beryllium	.14	0.93 J	0.8 B	0.68 B			0.38 B	0.43 B	0.57 B	0.57 B	0.66 B	0.73 B	0.71 B	0.42 B	0.55 B
Cadmium	290	1.6	47.9	4.5	3.3	2	8	2.4	2	3.4	4.4	2.7	3	2.4	
Calcium		57000	82900	35200	39000	67900	55200	60100	38700	35400	39800	33900	27100	36800	26100
Chromium	2900	24.6	511	62.1	27.6	16.8	48.4	32.7	39.1	109	186	62.7	33.5	32.5	22
Cobalt		12.8	11.2 B	10.4 B	3.5 B	5 B	6.3 B	5 B	9.4 B	11 B	11.3 B	11 B	10.2 B	6.7 B	10.3 B
Copper		44.1	378	163	26.7	69.1	121	47.9	121	182	247	152	96.1	142	41.9
Iron		22000	24100	40500	7060	23600	14800	12300	25700	30000	38300	46900	72300	38700	23200
Lead		128	635	352	60	31.2	560	120	272	302	396	241	166	123	146
Magnesium		22400	45000	19400	21200	37900	31000	27200	20400	19300	21200	18400	15000	18000	14900
Manganese	2900	462 J	370	389	152	252	239	301	376	357	411	438	594	355	305
Mercury	170	0.26 J	5	6.7	0.18		1.1	0.27	3.3	6.3	8.5	5.7	4.4	0.52	1.1
Nickel	12000	26.4	108	25	28.8	34.7	34.1	18.9	25.9	27.2	31.6	22.4	18.2	14.8	24.7
Potassium		1480	988 B	1700 B			410 B	529 B	1070 B	1570 B	1850 B	1100 B	927 B		1550 B
Selenium	2900	0.23 UJ													
Silver	2900	1.7 U	10.8	4 B					3.3 B	4.7	6.3	2.4 B			
Sodium		372	460 B	444 B	261 B	229 B	327 B	352 B	328 B	303 B	365 B	319 B	318	233 B	267 B
Thallium		0.34 U	1.2 B							0.55 B	0.68 B	0.43 B			0.34 B
Vanadium	4000	23.3	17.6 B	22.2	5.6 B	7.6 B	8.2 B	9.8 B	19.2 B	21.1	23.6	23.4	21.8	11.6 B	19.5
Zinc	170000	212	1940	762	155	148	757	179	467	577	757	554	454	161	167

Sampling Location	X214	X215	X216	X217	X218	X219	X220	X221	X222	X223	X224	X226	X226	X227
Date Collected	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-22-97	9-23-97	9-23-97	9-23-97	9-23-97
Water Depth	7'	6'	6'	6'	6"	6"	6"	6"	6"	6"			2'	1'
Depth in Sediment	top 1'	top 1'	top 1'	7'	top 1'	4'	7'	top 1'	4'	7'	top 1'	top 1'	top 1'	top 1'
Semi-Volatiles														
Naphthalene	1800 J	1800 J	770 J	2300 J			4300 J	26000						
2-Methylnaphthalene		1600 J	1900 J	2200 J			1900 J	11000						
Acenaphthylene	1900 J	2800 J		3600 J			3500 J	3900 J	1600 J	110 J		110 J		
Acenaphthene	7500 J	11000	2700 J	5000 J	4400 J	3500 J	8500	18000	910 J	630 J	61 J		390 J	
Dibenzofuran							2600 J	1100 J				110 J		
Fluorene	6900 J	11000	2600 J	4100 J	4700 J	3500 J	7600	10000		110 J		200 J		
Phenanthrene	49000 D	94000 D	13000	34000	1600 J	24000	41000 D	100000 D	1100 J	420 J	510 J	1900		89 J
Anthracene	12000	26000	3600 J	10000 J	9000	6700 J	19000	21000	2100 J	260 J	130 J	340 J		
Carbazole												73 J		
Di-n-Butylphthalate										210 JB	170 JB	66 JB	290 JB	540 B
Fluoranthene	32000	27000 D	11000	48000	23000	28000	120000 D	100000 D	11000	1200	1400	3000	180	210 J
Pyrene	61000	39000 D	14000	46000	14000	15000 J	31000	57000 D	12000	960	730	1000	340 J	170 J
Benzo(a)anthracene	19000		5600	29000	9400	11000 J	37000	3900		680	360 J	600		83 J
Chrysene	22000		5800	28000	12000	12000 J	44000		7000	880	410	710		95 J
bis(2-Ethylhexyl)phthalate														
Benzo(b)fluoranthene	7000 J	15000	2300 J	11000	6400	10000 J	38000	22000	4100 J	700 J	360 J	540		86 J
Benzo(k)fluoranthene	7500 J	16000	3300 J	15000	4900 J	7200 J	30000	20000	3500 J	750 J	280 J	460		93 J
Benzo(a)pyrene	16000	30000	4400	23000	5400 J	11000 J	32000	41000	3600 J	850	330 J	540		87 J
Indeno(1,2,3-cd)pyrene	9900	10000	2200 J	10000 J	2400 J		10000	15000		580 J	170 J	300 J		76 J
Dibenzo(a,h)anthracene		5000 J	820 J	3300 J	960 J		3700 J	3600 J		200 J				
Benzo(g,h,i)perylene	8500 J	9400 J	2500 J	9500 J	2800 J		7900	15000		580 J		350 J		80 J
Inorganics														
Aluminum	9430	8290	8050	7440	7680	11400	9140	11100	6940	8560	4130	2710	4740	2610
Arsenic	8.3	9.7	8.8	21.3	22.5	30.1	26.5 B	10.2	8.9	9.4	1.1 B	2.9	2.7 B	5
Barium	87	97.7	83	150	99.4	321	373	111	111	91	156	63.3	44.5 B	51.4
Beryllium	0.75 B	0.69 B	0.71 B	0.77 B	0.69 B	0.87 B	0.82 B	0.84 B	0.74 B	0.72 B	0.5 B	0.46 B	0.51 B	0.37 B
Cadmium					7.2	6.3	5.3		5.8	2.3	1.1			
Calcium	30800	31900	26800	43400	12100	26600	38000	36800	20000	17000	123000	144000	51100	101000
Chromium	22.9	22.8	19.5	35.1	174	218	253	30.6	59.2	47.7	11.4	10.8	11	8.8
Cobalt	9 B	8.4 B	8.1 B	8.5 B	8.5 B	10.5 B	10.2 B	10.2 B	7.9 B	8.3 B	3 B	2.9 B	6.6 B	5.1 B
Copper	56.5	78.6	53.6	186	375	375	397	105	141	81.1	24.6	19.7	22.1	16.1
Iron	28700	20100	18500	32700	21300	28200	25700	30000	16600	20300	14600	20300	11400	25200
Lead	76.2	92.7	102	282	554	526	625	245	322	150	31.6	154	91.3	20
Magnesium	17600	18000	15000	24100	7180	14300	18600	20400	11300	9560	70900	74100	29900	54000
Manganese	435	406	317	351	131	292	329	368	202	491	422	764	260	807
Mercury	1.8	2.6	0.99	3.3	2.9	5.6	12.7	3.8	1.2	0.33	0.63		0.48	0.12
Nickel	28	24.3	24.6	25.6	116	51.2	48.6	31.8	29	30.4	11.2	9.5	15.7	13.2
Potassium	1270 B	933 B	1130 B	1410 B	799 B	1600 B	1280 B	1500 B	753 B	1240 B	656 B	387 B	837 B	454 B
Silver	2 B	1.9 B	2.1 B	2.6 B	2.9 B	9.1	11.7	2.9 B		1.8 B				1.5 B
Sodium	251 B	259 B	208 B	232 B	290 B	295 B	318 B	262 B	221 B	302 B	692 B	376 B	216 B	273 B
Thallium				0.39 B		0.8	0.72 B				0.23 B	0.24 B	0.29 B	0.25 B
Vanadium	21.5	19.5	18.8	20.7	21.6 B	25.4	24.6	23.9	17.5	20.5	8.3 B	7.9 B	12.3 B	12.4 B
Zinc	226	352	209	593	471	1170	1360	471	343	206	82.1	63.2	111	36.4

Sampling Location	X242	X228	X243	X229	X230	X244	X245S	X245D	X246	X247
Date Collected	11-8-99	9-23-97	11-8-99	9-23-97	9-23-97	11-8-99	11-9-99	11-8-99	11-8-99	11-8-99
Water Depth	1.5'			1'	1'	1'	1.5'	1.5'	1.5'	1'
Depth in Sediment	2'	top 1'	top 6"	top 1'	top 1'	top 6"	1'	7'	top 1'	top 1'
Volatiles										
[illegible]exane	31					1700 J	290	57	1200 J	11000
Benzene	15 U						4 J	3 J		
Methylcyclohexane	130 J					25000	840 J	94 J	12000	55000
Toluene	0.9 J		0.7 J				5 J	2 J		620 J
Xylenes (total)	5 J					400 J	97 J	16		20000 J
Isopropylbenzene	8 J					400 J	64 J	10 J	680 J	2000 J
Semi-Volatiles										
Naphthalene	1100 J									
2-Methylnaphthalene						1800 J		35000	1500 J	170000
Acenaphthene					1100 J	3500 J		5000 J		13000
Dibenzofuran						2800 J		5300 J	1200 J	27000
Fluorene					1500 J	5600 J		6800 J	1100 J	26000
Phenanthrene	2800 J	410 J	3300 J	630 J	1700 J	23000		47000	6300 J	180000
Anthracene		110 J	430 J	2000 J		4400 J		6500 J		17000
Carbazole			350 J							28000
Di-n-Butylphthalate		310 JB		940 JB	1100 JB					
Fluoranthene	1700 J	1400	4500 J	2700 J	6600	9300 J		9700 J	1800 J	46000
Pyrene	2900 J	740	4300 J	6000	13000	14000 J		23000	2600 J	66000
Benzo(a)anthracene	1300 J	440	2000 J	1800 J	2700 J	5300 J		9700 J	1800 J	19000
Chrysene	1600 J	530 J	1900 J	2800 J	4500 J	8300 J		16000	2700 J	31000
bis(2-Ethylhexyl)phthalate	1200 J	150 J				3100 J		5200 J	1500 J	45000
Benzo(b)fluoranthene		530 J	2300 J		1500 J	3000 J		6900 J	1500 J	8700
Benzo(k)fluoranthene		570 J	670 J			630 J		1700 J	420 J	2000
Benzo(a)pyrene	990 J	570 J	1400 J	1600 J	1400 J	3100 J		7600 J	1400 J	8100
Indeno(1,2,3-cd)pyrene		360 J	970 J			1500 J		3300 J	1100 J	3200
Dibenzo(a,h)anthracene								4300 J		28000
Benzo(g,h,i)perylene		350 J	840 J			2700 J		6200 J	2100 J	8100
Pesticides/PCBs										
alpha-BHC	2.5 U		2.0 U			2.7 U	2.7 U	2.5 U	2.6 U	47
beta-BHC	0.24 J		2.0 U			2.7 U	1.6 J	3.1 J	0.81 J	180
delta-BHC	0.25 J		2.0 U			2.7 U	2.7 U	2.5 U	2.6 U	57
gamma-BHC (Lindane)	2.5 R		2.0 U			2.7 U	2.7 U	2.5 U	2.6 U	47
Heptachlor	2.5 R		2.0 U			2.7 U	2.7 U	2.5 U	2.6 U	47
Aldrin	2.5 R		2.0 U			2.7 U	2.7 U	16 J	2.6 U	380
Heptachlor epoxide	2.5 U		2.0 U			2.2 J	2.7 U	2.5 U	2.6 U	47
Endosulfan I	2.5 U		0.070 J			1.1 J	1.1 J	2.5 U	2.6 U	47
Dieldrin	9.1 J		3.8 U			4.6 J	4.4 J	8.9 J	3.5 J	180
4,4'-DDE	31		0.68 J			30 J	15	73	18	590
Endrin	25 J		3.8 U			14 J	10 J	45	8.9	92
Endosulfan II	8.9 J		3.8 U			5.2 U	7.5 J	16 J	6.6	140
4,4'-DDD	6.4 J		1.1 J			8.9 J	5.2 J	4.4 J	22 J	580
Endosulfan sulfate	4.9 U		3.8 U			5.2 U	5.2 U	4.8 U	5.1 U	92
4,4'-DDT	1.0 J		0.27 J			1.6 J	1.9 J	1.7 J	1.4 J	92
Methoxychlor	25 U		20 U			27 U	27 U	25 U	26 U	170
Endrin ketone	1.6 J		0.46 J			5.2 U	2.3 J	0.61 J	5.1 U	28
Endrin aldehyde	4.9 U		3.8 U			5.2 U	1.7 J	4.8 U	5.1 U	31
gamma-Chlordane	7.5 J		0.78 J			1.8 J	0.65 J	2.5 U	5.8 J	47
Aroclor-1242	3700 J		38 U			52 U	52 U	48 U	51 U	920
Aroclor-1248	49 U		38 U			52 U	52 U	48 U	360	920
Inorganics										
Aluminum	14400	6540	1710	4710	6250	8770		11400	6400	11300
Antimony	11.2 UJ		10.0 J			10.1 UJ		9.8 UJ	11.9 J	15.6
Arsenic	14.0	6.4	9.1	7.6	13.7	11.3		9.6	8.6	15.5
Barium	191	62.5	63.3	53.5 B	72	91.7		62.5	64.0	286
Beryllium	2.2	0.59 B	0.34 J	0.86 B	0.61 B	0.74 J		0.80 J	0.67 J	1.5
Cadmium	8.5		0.65 U	2.1	2.5	7.0		1.5	0.88	61.4
Calcium	70400	76700	113000	62000	38200	51200		54300	73200	50600
Chromium	176	21.5	6.9	63.4	67.8	212		39.4	25.6	534
Cobalt	7.9	7.6 B	3.0	7.7 B	7.9 B	7.0		11.0	6.7	18.9
Copper	146	113	31.4	56.6	97	160		49.4	33.9	429
Iron	21100	37400	8750	19500	19800	19200		21000	14200	32900
Lead	735	91.5	41.6 J	167	388	631		272	253	5310
Magnesium	31900	35000	62100	31800	15000	25500		28400	36100	23400
Manganese	662 J	514	371 J	254	247	292 J		374 J	383 J	379
Mercury	1.0 J	0.36	0.070 J	1.4	0.54	4.3 J		1.7 J	0.59 J	2.2
Nickel	53.1	22.1	6.6 U	38.4	31.9	59.3		27.2	17.3	221
Potassium	1370	948 B	346	899 B	815 B	1350		2550	680	1030
Selenium	0.53 J		1.4 UJ			0.31 J		0.18 UJ	0.19 UJ	3.1
Silver	1.5 U	2.3 B	1.0 U	1.6 B		1.4 U		1.4 U	1.4 U	8.3
Sodium	406	254 B	300	202 B	318 B	265		295	170 J	433
Thallium	0.32 U		0.21 UJ			0.29 U		0.28 U	0.28 U	0.46
Vanadium	21.2	15.1	7.3	11.1 B	15.6 B	21.2		25.2	17.7	33.2
Zinc	440	727	71.2	172	210	371		173	95.9	1590

Sampling Location	X248	X249	X250	X251	X231	X252	X253	X254	X255	X256	X257	X258	X259	X260	X232
Date Collected	11-8-99	11-8-99	11-8-99	11-8-99	9-23-97	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	11-9-99	9-23-97
Water Depth	1.6'	1.5'	1.5'	1.5'	1'	1.5'	1.5'	6"	6"	1'	1'	2'	2'	2'	2'
Depth in Sediment	top 1'	top 1'	top 1'	top 1'	2'	top 1'	top 1'	5'	5'	top 6"	top 6"	2'	3'	top 2'	2'
Volatiles															
[illegible]exane	70000	62000	120000	150000		170	150000	85000	4900	19 U	8 J	50	81 J	1 J	
Benzene	2800 J	3200 U	4000 U	4800		23 U	8800	8800	1200 J	19 U	19 U	14 U	21 J	18 U	
Methylcyclohexane	250000	230000	480000	580000		140	590000	350000	28000	19 UJ	14 J	170	530 J	0.9 J	
Toluene	12000	1500 J	3300	14000		23 U	7300	3400	150 J	0.6 J	19 U	14 U	21 U	0.7 J	
Xylenes (total)	140000	50000	95000	250000		10 J	110000	110000	670	19 U	2 J	6 J	6 J	18 U	
Isopropylbenzene	12000	13000	28000	23000		23 U	49000	21000	1800 J	19 U	19 U	14 U	9 J	18 U	
Semi-Volatiles															
2-Methylnaphthalene	37000	120000	170000	150000	37000	1200 J	55000	220000	40000	510 J	19000 U	790 J	21000 U	18000 U	
Acenaphthene	5500 J	12000 J	11000 J	20000 J		23000 U	6400 J	23000 J	15000 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Dibenzofuran	3800 J	23000 J	22000 J	15000 J		23000 U	6600 J	24000 J	8800 J	19000 U	19000 U	14000 U	21000 U	18000 U	
Fluorene	7300 J	20000 J	25000 J	27000 J		460 J	8200 J	30000 J	16000 J	19000 J	19000 U	370 J	21000 U	18000 U	
Phenanthrene	36000	100000	83000	140000	52000	3000 J	34000	140000	78000	2100 J	1500 J	11000 J	21000 U	18000 U	630 J
Anthracene	8800 J	12000 J	12000 J	21000 J		23000 U	5100 J	24000 J	13000 J	19000 J	19000 U	580 J	21000 U	18000 U	
Carbazole	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 UJ	19000 UJ	120 J	21000 UJ	18000 UJ	
Di-n-Butylphthalate															360 JB
Fluoranthene	11000	14000 J	11000 J	31000 J	10000	4000 J	5900 J	2700 J	9500 J	630 J	520 J	2800 J	470 J	330 J	2700 J
Pyrene	47000	27000	29000	58000	10000	4100 J	12000 J	49000 J	34000	2900 J	2000 J	14000 J	1100 J	360 J	1400 J
Benzo(a)anthracene	9600	8400 J	6800 J	14000 J	5700 J	1500 J	2800 J	12000 J	5700 J	1300 J	1000 J	25000	21000 U	18000 U	590 J
Chrysene	19000	18000 J	11000	23000 J	7900	2700 J	5600 J	19000 J	9500 J	5300 J	3400 J	27000	21000 U	18000 U	920 J
bis(2-Ethylhexyl)phthalate	33000 U	30000 U	29000	20000 U		23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	14000 U	21000 U	18000 U	960 J
Benzo(b)fluoranthene	4600 J	4900 J	3900 J	9200 J	1900 J	3200 J	1600 J	6600 J	2600 J	19000 J	19000 U	8300 J	21000 U	18000 U	930 J
Benzo(k)fluoranthene	930 J	1500 J	940 J	2300 J	1500 J	780 J	420 J	1400 J	740 J	19000 U	19000 J	1000 J	21000 U	18000 U	800 J
Benzo(a)pyrene	5100 J	4700 J	3300 J	8300 J	2800 J	1800 J	1500 J	5600 J	2800 J	1400 J	950 J	7400 J	21000 U	18000 U	840 J
Indeno(1,2,3-cd)pyrene	2000 U	1700 J	1300 J	3600 J		1800 J	29000 U	64000 U	890 J	19000 U	19000 U	2600 J	21000 U	18000 U	560 J
Dibenzo(a,h)anthracene	33000 U	27000 U	33000 U	28000 U		23000 U	29000 U	64000 U	21000 U	19000 U	19000 U	3100 J	21000 U	18000 U	
Benzo(g,h,i)perylene	6400 J	3900 J	2300 J	6800 J		1800 J	29000 U	64000 U	1900 J	19000 U	19000 U	4600 J	21000 U	18000 U	
Pesticides/PCBs															
alpha-BHC	10 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	0.75 J	0.57 J	3.6 U	3.1 U	
beta-BHC	5.7 U	46 U	57 U	47 U		4.0 U	37 J	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
delta-BHC	5.7 U	74 J	70 J	130 J		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	1.3 J	2.3 U	3.6 U	3.1 U	
gamma-BHC (Lindane)	5.7 U	46 U	57 U	47 U		4.0 U	19 J	25 J	4.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor	2.3 J	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Aldrin	11	46 U	57 U	200		4.0 U	4.9 R	3.6 R	7.2 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Heptachlor epoxide	5.7 U	46 U	57 U	47 U		4.0 U	72 J	27 J	2.0 J	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Endosulfan I	24 J	46 U	57 U	91 J		0.35 J	4.9 R	3.6 R	3.6 U	3.3 U	3.2 U	2.3 U	3.6 U	3.1 U	
Dieldrin	11 U	100 J	98 J	92 U		7.7 J	9.4 R	7.0 R	2.6 J	1.5 J	6.2 U	4.5 U	7.0 U	3.1 U	
4,4'-DDE	11 U	270 J	260 J	92 U		2.2 J	56 J	7.0 R	11 J	6.4 U	1.7 J	1.7 J	4.7 J	2.1 J	
Endrin	70	160 J	170	92 U		1.9 J	9.4 R	34 J	12	6.4 U	2.1 J	2.5 J	3.0 J	2.5 J	
Endosulfan II	11 U	160	150	220 J		1.8 J	15 J	7.1 J	7.0 U	6.4 U	6.2 U	2.2 J	3.0 J	6.0 U	
4,4'-DDD	11 U	230 J	250	92 U		1.8 J	7.8 J	14 J	3.2 J	6.4 U	6.2 U	1.5 J	2.3 J	1.2 J	
Endosulfan sulfate	11 U	89 U	110 U	92 U		7.7 U	9.4 R	9.3 J	7.0 U	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
4,4'-DDT	13	12 J	13 J	92 U		7.7 U	4.1 J	1.7 J	4.5 J	6.4 U	6.2 U	4.5 U	1.0 J	6 U	
Methoxychlor	57 U	460 U	570 U	470 U		40 U	49 U	36 R	12 J	33 U	32 U	9.6 J	36 U	31 U	
Endrin ketone	5.1 J	2.4 J	2.9 J	92 U		0.8 J	8.3 J	1.5 J	1.0 J	6.4 U	6.2 U	4.5 U	7.0 U	6.0 U	
Endrin aldehyde	11 U	89 U	110 U	45 J		7.7 U	9.4 R	7.0 R	7.0 U	6.4 U	6.2 U	0.75 J	7.0 U	6.0 U	
gamma-Chlordane	5.7 U	46 U	57 U	47 U		4.0 U	4.9 R	3.6 R	3.6 U	6.4 U	6.2 U	1.6 J	1.1 J	3.1 U	
Aroclor-1242	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Aroclor-1248	110 U	890 U	1100 U	920 U		77 U	94 R	70 R	70 U	63 U	62 U	45 U	70 U	60 U	
Inorganics															
Aluminum	11100	19700	15300	12800	12200	7270	12500	15200	9550	9300	9940	9700	11300	11300	3640
Antimony	10.9 UJ	20.1 UJ	38.8 J	19.8 J		16.7 J	20.2 J	12.1 UJ	13.1 UJ	14.9 UJ	14.1 UJ	11.3 UJ	14.4 J	12.8 UJ	
Arsenic	11.2	18.5	19.1	28.4	23.4	8.2	29.4	16.4 J	12.6 J	10.3	7.4	6.0	9.7	7.7	14.7
Barium	81.1	249	256	397	360	78.0	360	159	136	88.3	67.1	75.7	69.7	71.8	49.4 B
Beryllium	0.87 J	1.7 J	1.6 J	1.8 J	1.5 B	0.56 J	1.3 J	1.2 J	0.86 J	0.90 J	0.93 J	0.81 J	1.2 J	0.84 J	0.46 B
Cadmium	4.4	45.9	51.8	97.5	91.1	1.4	66.3	6.3	10.8	1.4	1.2 U	1.7	1.2	1.7	
Calcium	58900	46400	45700	50400	51600	104000	69400	45600	76700	75000	69100	79800	67100	81100	1E+05
Chromium	57.9	465	505	738	698	92.6	561	78.0	142	25.6	25.9	30.3	28.7	31.7	14.8
Cobalt	9.5	19.5	18.9	19.4	18.1 B	7.9	15.8	12.1	11.0	10.0	8.2	9.9	10.4	8.9	4.5 B
Copper	87.8	402	419	936	697	40.1	1860	137	203	39.6	28.0	46.2	43.6	45.0	28.4
Iron	22800	32200	30500	32300	30400	17500	31200	29200	21700	22200	18700	18600	23700	20100	11900
Lead	780	2660	2970	3850	5070	127	3340	1040	619 J	38.9	34.3	120	168	95.7	54.6
Magnesium	29900	20200	19600	18300	17300	25800	18400	13200	20500	23500	22700	36800	32100	24300	71100
Manganese	363 J	322 J	328 J	329 J	341	413 J	375 J	341 J	366 J	496 J	410 J	332 J	423 J	478 J	816
Mercury	1.1 J	2.0 J	1.9 J	3.7 J	2.9	0.20 J	3.4 J	3.0 J	1.2 J	0.12 J	0.11 J	0.25 J	1.5 J	0.13 J	0.2
Nickel	41.4	218	237	206	236	20.9	184	38.1	47.8	28.7	23.4	34.2	31.4	28.5	14.3
Potassium	1920	4470	3010	1880	2070 B	1280	1850	2310	1410	1810	2270	1760	2570	2380	597 B
Selenium	0.21 UJ	1.8 J	2.6 J	1.4 J		0.56 J	1.4 J	2.3 UJ	0.58 UJ	0.61 J	0.27 UJ	0.50 J	0.20 UJ	0.35 J	
Silver	1.5 U	8.7	9.9	16.8	17.7	2.1 U	11.3	1.7 U	1.8 U	2.1 U	1.9 U	1.6 U	1.5 U	1.8 U	1.5 B
Sodium	202 J	595	621	759	576 B	348	551	337	450	300 J	333	233 J	236 J	256 J	342 B
Thallium	0.31 U	0.57 U	0.66	1.2	1.2 B	0.42 U	0.56	0.34 U	0.37 U	0.42 U	0.40 U	0.32 U	0.30 U	0.36 U	
Vanadium	23.0	47.4	38.1	39.2	32.3	29.7	30.1	30.3	27.9	38.2	40.2	25.9	25.1	27.0	13.2 B
Zinc	257	1510	1680	3350	2980	328	2640	383	586	230	199	207	178	212	140

Sediment analytical results that exceed the SCDM Soil Screening Benchmarks are printed in red ink.
The volatiles, semi-volatiles and pesticides/pcbs are shown in parts per billion. The inorganics are shown in parts per million.

Table 4

Appendix C

Target Compound List

TARGET COMPOUND LIST

Volatile Target Compounds

Chloromethane	1,2-Dichloropropane
Bromomethane	cis-1,3-Dichloropropene
Vinyl Chlorde	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropene
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroehtene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
2-Butanone	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethylbenzene
Vinyl Acetate	Styrene
Bromodichloromethane	Xylenes (total)

Base/Neutral Target Compounds

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl) Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis (2-Chloroisopropyl) Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene
2-Methylnaphthalene	Di-n-Butylphthalate
1,2,4-Trichlorobenzene	Fluoranthene

Pesticide/PCB Target Compounds

alpha-BHC	Endrin Ketone
beta-BHC	Endosulfan Sulfate
delta-BHC	Methoxychlor
gamma-BHC (Lindane)	alpha-Chlordane
Heptachlor	gamma-Chlordane
Aldrin	Toxaphene
Heptachlor epoxide	Aroclor-1016
Endosulfan I	Aroclor-1221
4,4'-DDE	Aroclor-1232
Dieldrin	Aroclor-1242
Endrin	Aroclor-1248
4,4'-DDD	Aroclor-1254
Endosulfan II	Aroclor-1260
4,4'-DDT	

Inorganic Target Compounds

Aluminum	Manganese
Antimony	Mercury
Arsenic	Nickel
Barium	Potassium
Beryllium	Selenium
Cadmium	Silver
Calcium	Sodium
Chromium	Thallium
Cobolt	Vanadium
Copper	Zinc
Iron	Cyanide
Lead	Sulfide
Magnesium	

Isophorone	Pyrene
Naphthalene	Butylbenzylphthalate
4-Chloroaniline	bis(2-Ethylhexyl)Phthalate
bis(2-chloroethoxy)Methane	Chrysene
Hexachlorocyclopentadiene	Benzo(a)Anthracene
2-Chloronaphthalene	3-3'-Dichlorobenzidene
2-Nitroaniline	Di-n-Octyl Phthalate
Acenaphthylene	Benzo(b)Fluoranthene
3-Nitroaniline	Benzo(k)Fluoranthene
Acenaphthene	Benzo(a)Pyrene
Dibenzofuran	Ideno(1,2,3-cd)Pyrene
Dimethyl Phthalate	Dibenz(a,h)Anthracene
2,6-Dinitrotoluene	Benzo(g,h,i)Perylene
Fluorene	1,2-Dichlorobenzene
4-Nitroaniline	1,3-Dichlorobenzene
4-Chlorophenyl-phenylether	1,4-Dichlorobenzene

Acid Target Compounds

Benzoic Acid	2,4,6-Trichlorophenol
Phenol	2,4,5-Trichlorophenol
2-Chlorophenol	4-Chloro-3-methylphenol
2-Nitrophenol	2,4-Dinitrophenol
2-Methylphenol	2-Methyl-4,6-dinitrophenol
2,4-Dimethylphenol	Pentachlorophenol
4-Methylphenol	4-Nitrophenol
2,4-Dichlorophenol	

Appendix D

Illinois EPA Site Photographs

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97
TIME: 1030
PHOTO BY: Peter Sorensen
PHOTO #: 1
SAMPLE#: X201
Photo Direction: South
COMMENTS:

DATE: 9 - 22 - 97
TIME: 1030
PHOTO BY: Peter Sorensen
Photo#: 2
SAMPLE #: X201
Photo Direction: East
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1100	
PHOTO BY: Bruce Everetts	
PHOTO #: 5	
SAMPLE#: X202	
Photo Direction: West	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1100	
PHOTO BY: Peter Sorensen	
Photo#: 6	
SAMPLE #: X202	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1500	
PHOTO BY: Peter Sorensen	
PHOTO #: 25	
SAMPLE#: X203	
Photo Direction: South	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1500	
PHOTO BY: Peter Sorensen	
Photo#: 26	
SAMPLE #: X203	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	COUNTY: Will

DATE: 9 - 22 - 97	
TIME: 1515	
PHOTO BY: Bruce Everetts	
PHOTO #: 29	
SAMPLE#: X204	
Photo Direction: South	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1515	
PHOTO BY: Peter Sorensen	
Photo#: 30	
SAMPLE #: X204	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97
TIME: 1545
PHOTO BY: Peter Sorensen
PHOTO #: 31
SAMPLE#: X205
Photo Direction: South
COMMENTS:

DATE: 9 - 22 - 97
TIME: 1545
PHOTO BY: Peter Sorensen
Photo#: 32
SAMPLE #: X205
Photo Direction: East
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1610	
PHOTO BY: Peter Sorensen	
PHOTO #: 33	
SAMPLE#: X206	
Photo Direction: North	
COMMENTS:	
Photo board shows this as being sample X209 and being collected at 1600 which in incorrect.	

DATE: 9 - 22 - 97	
TIME: 1610	
PHOTO BY: Peter Sorensen	
Photo#: 34	
SAMPLE #: X206	
Photo Direction: South	
COMMENTS:	
Photo board shows this as being sample X209 and being collected at 1600 which in incorrect.	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1115	
PHOTO BY: Bruce Everetts	
PHOTO #: 7	
SAMPLE#: X207	
Photo Direction: South	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1115	
PHOTO BY: Peter Sorensen	
Photo#: 8	
SAMPLE #: X207	
Photo Direction: North	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1145	
PHOTO BY: Bruce Everetts	
PHOTO #: 9	
SAMPLE#: X208/X209/X210	
Photo Direction: South	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1145	
PHOTO BY: Peter Sorensen	
Photo#: 10	
SAMPLE #: X208/X209/X210	
Photo Direction: North	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1245	
PHOTO BY: Peter Sorensen	
PHOTO #: 15	
SAMPLE#: X211	
Photo Direction: North	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1245	
PHOTO BY: Peter Sorensen	
Photo#: 2	
SAMPLE #: X211	
Photo Direction: South	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97
TIME: 1230
PHOTO BY: Peter Sorensen
PHOTO #: 13
SAMPLE#: X212/X213
Photo Direction: North
COMMENTS:

DATE: 9 - 22 - 97
TIME: 1230
PHOTO BY: Peter Sorensen
Photo#: 14
SAMPLE #: X212/X213
Photo Direction: South
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97

TIME: 1300

PHOTO BY: Bruce Everetts

PHOTO #: 15

SAMPLE#: X214

Photo Direction: North

COMMENTS:

DATE: 9 - 22 - 97

TIME: 1300

PHOTO BY: Peter Sorensen

Photo#: 16

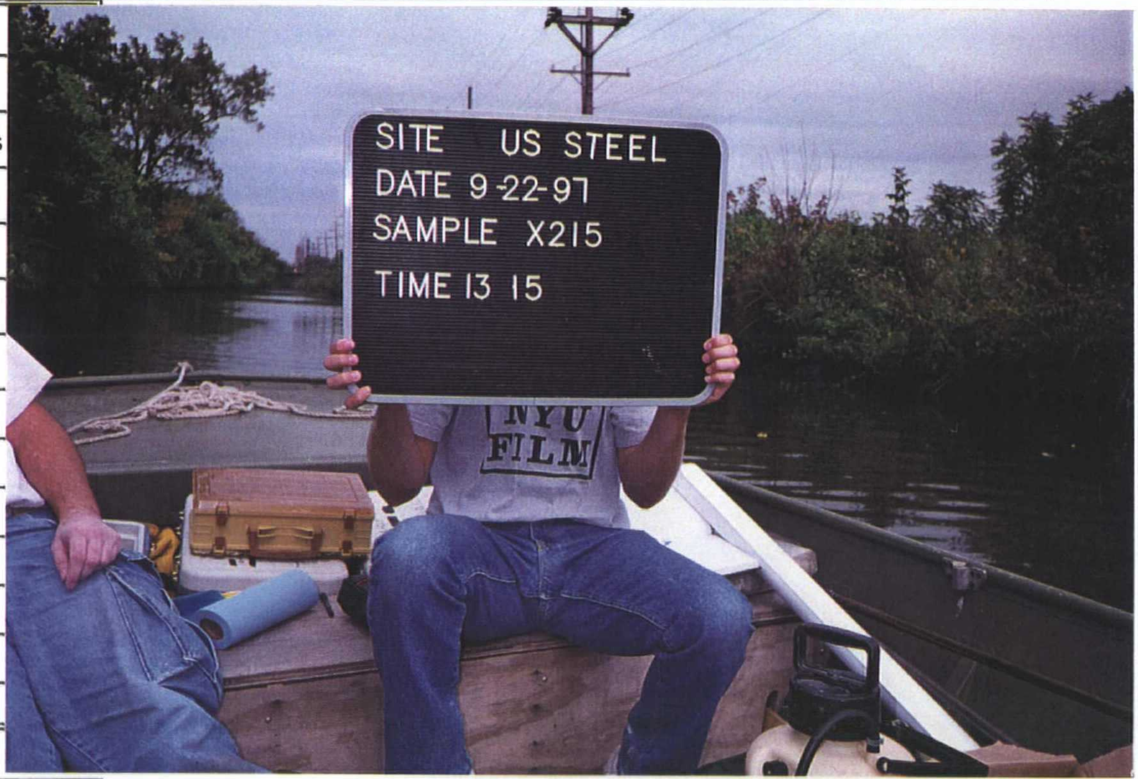
SAMPLE #: X214

Photo Direction: South

COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

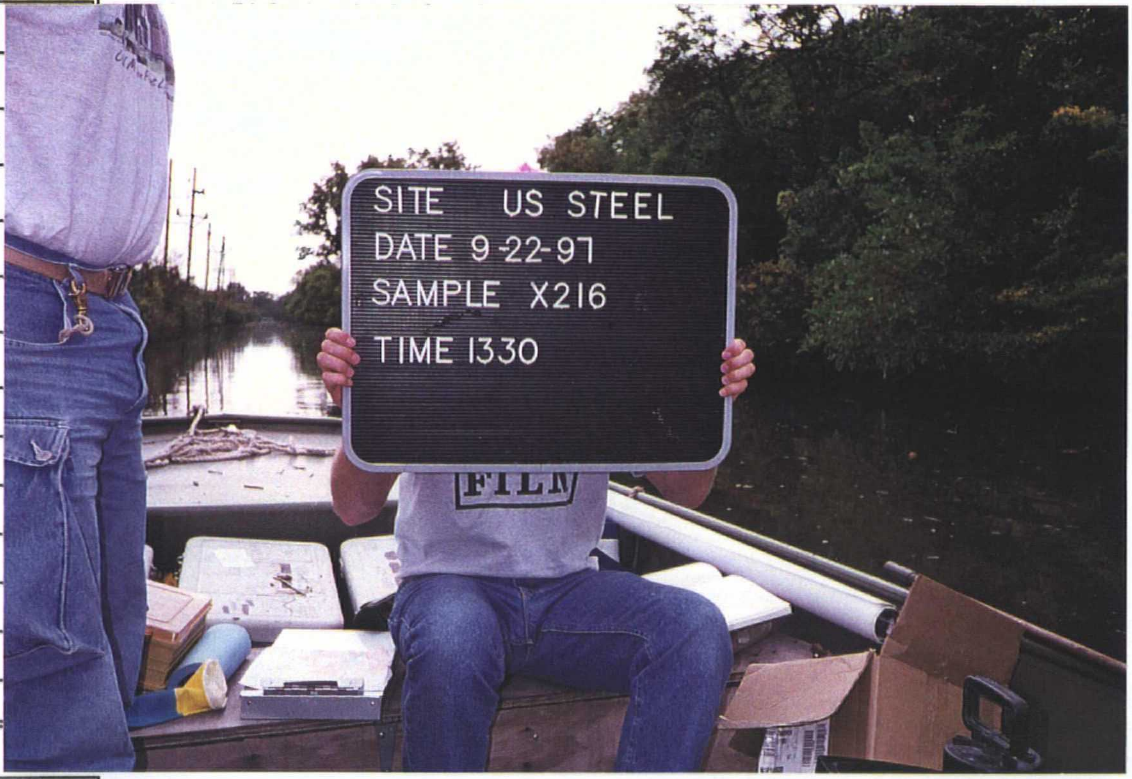
DATE: 9 - 22 - 97	
TIME: 1315	
PHOTO BY: Bruce Everetts	
PHOTO #: 17	
SAMPLE#: X215	
Photo Direction: ~~South~~ North	
COMMENTS:	



DATE: 9 - 22 - 97	
TIME: 1315	
PHOTO BY: Peter Sorensen	
Photo#: 18	
SAMPLE #: X215	
Photo Direction: ~~North~~ South	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97
TIME: 1330
PHOTO BY: Bruce Everetts
PHOTO #: 19
SAMPLE#: X216
Photo Direction: South
COMMENTS:



DATE: 9 - 22 - 97
TIME: 1330
PHOTO BY: Peter Sorensen
Photo#: 20
SAMPLE #: X216
Photo Direction: North
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97

TIME: 1400

PHOTO BY: Bruce Everetts

PHOTO #: 23

SAMPLE#: X217

Photo Direction: ~~North~~ South

COMMENTS:

DATE: 9 - 22 - 97

TIME: 1400

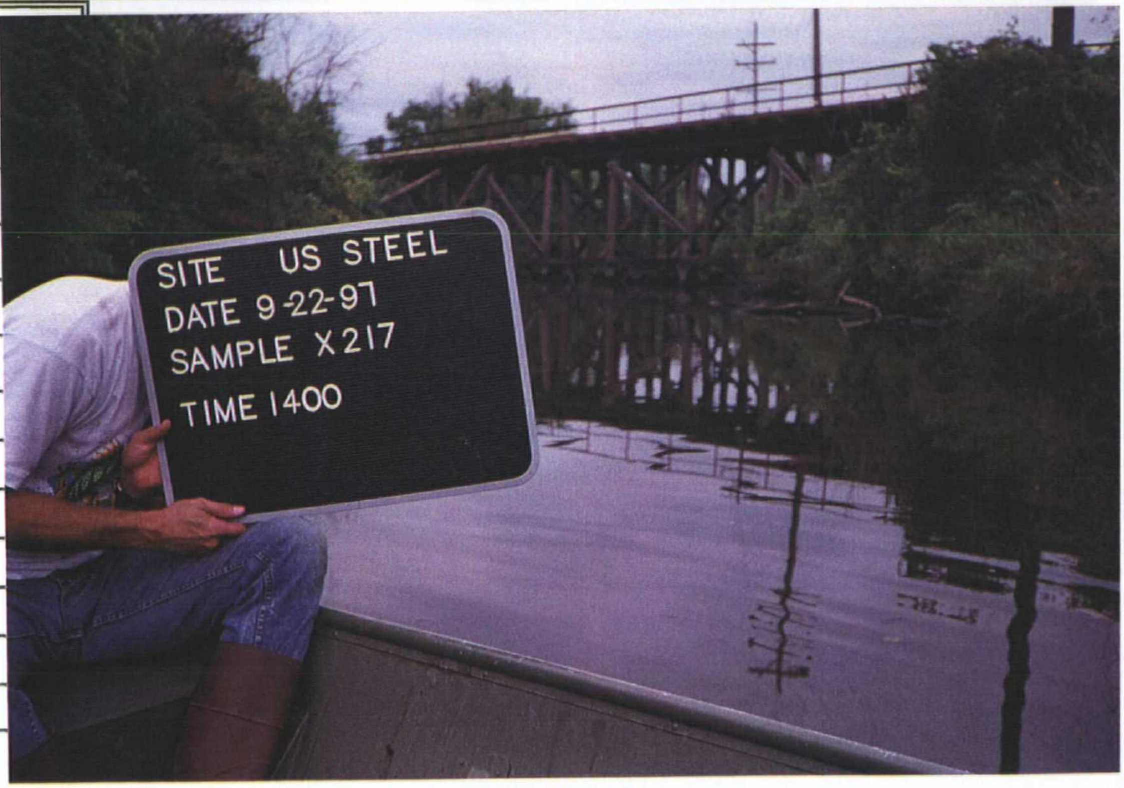
PHOTO BY: Peter Sorensen

Photo#: 24

SAMPLE #: X217

Photo Direction: ~~South~~ North

COMMENTS:



SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97
TIME: 1730
PHOTO BY: Bruce Everetts
PHOTO #: 37
SAMPLE#: X218/X219/X220
Photo Direction: East
COMMENTS:

DATE: 9 - 22 - 97
TIME: 1730
PHOTO BY: Bruce Everetts
Photo#: 38
SAMPLE #: X218/X219/X220
Photo Direction: West
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97	
TIME: 1800	
PHOTO BY: Bruce Everetts	
PHOTO #: 39	
SAMPLE#: X221/X222/X223	
Photo Direction: East	
COMMENTS:	

DATE: 9 - 22 - 97	
TIME: 1800	
PHOTO BY: Bruce Everetts	
Photo#: 40	
SAMPLE #: X221/X222/X223	
Photo Direction: West	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97	
TIME: 800	
PHOTO BY: Peter Sorensen	
PHOTO #: 41	
SAMPLE#: X224/X225	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97	
TIME: 930	
PHOTO BY: Peter Sorensen	
PHOTO #: 42	
SAMPLE#: X226	
Photo Direction: South	
COMMENTS:	

DATE: 9 - 23 - 97	
TIME: 930	
PHOTO BY: Peter Sorensen	
Photo#: 43	
SAMPLE #: X226	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97	
TIME: 1000	
PHOTO BY: Peter Sorensen	
PHOTO #: 44	
SAMPLE#: X227	
Photo Direction: North	
COMMENTS:	

DATE: 9 - 23 - 97	
TIME: 1000	
PHOTO BY: Peter Sorensen	
Photo#: 45	
SAMPLE #: X227	
Photo Direction: East	
COMMENTS:	

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97
TIME: 1030
PHOTO BY: Peter Sorensen
PHOTO #: 46
SAMPLE#: X228
Photo Direction: West
COMMENTS:

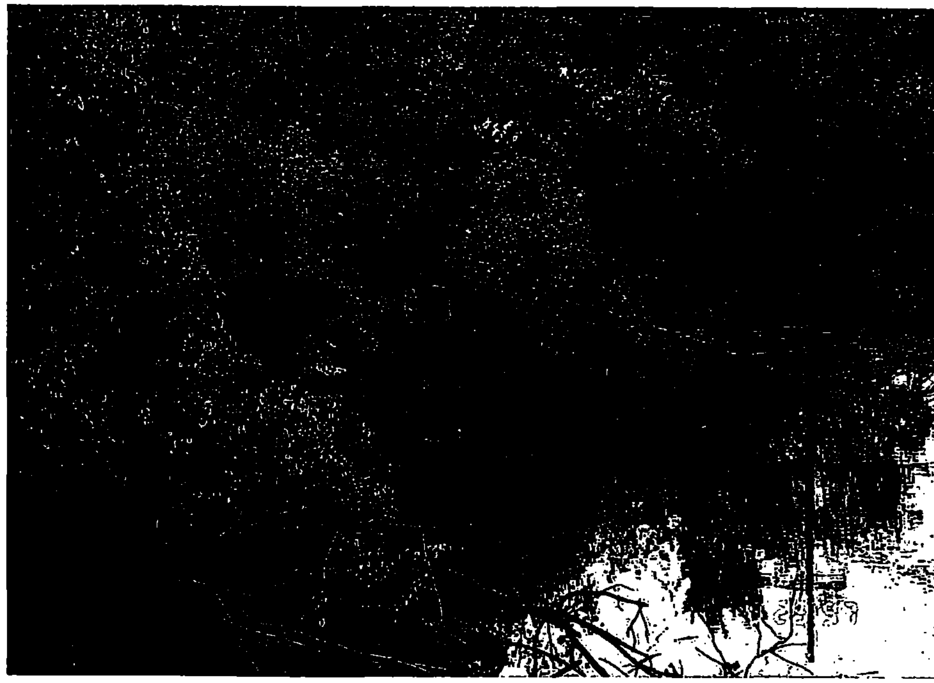
DATE: 9 - 23 - 97
TIME: 1030
PHOTO BY: Peter Sorensen
Photo#: 47
SAMPLE #: X228
Photo Direction: North
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97
TIME: 1100
PHOTO BY: Peter Sorensen
PHOTO #: 48
SAMPLE#: X229/X230
Photo Direction: East
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97
TIME: 1145
PHOTO BY: Peter Sorensen
PHOTO #: 49
SAMPLE#: X231
Photo Direction: South
COMMENTS:



SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 23 - 97
TIME: 1215
PHOTO BY: Peter Sorensen
PHOTO #: 50
SAMPLE#: X232
Photo Direction: Northwest
COMMENTS:

SITE NAME: US Steel - Joliet Works	
SITE ILD# : 005 454 566	**COUNTY:** Will

DATE: 9 - 22 - 97

TIME: 1640

PHOTO BY: Bruce Everetts

PHOTO #: 35

SAMPLE#: X240

Photo Direction: South

COMMENTS:

DATE: 9 - 22 - 97

TIME: 1640

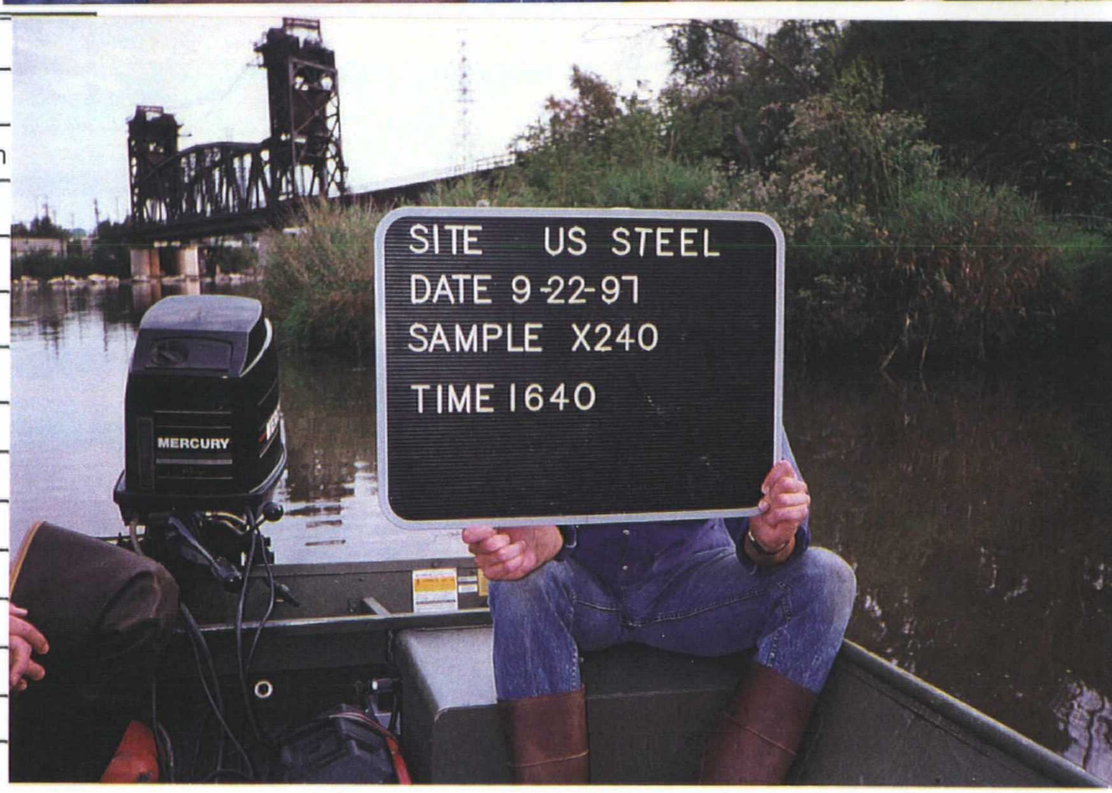
PHOTO BY: Peter Sorensen

Photo#: 36

SAMPLE #: X240

Photo Direction: North

COMMENTS:



Date: 11/8/99

Time: 10:43 am

I & M Canal

ILD 984 785 071

Sample Location: X242

Photo Direction: north

Date: 11/8/99

Time: 10:43 am

I & M Canal

ILD 984 785 071

Sample Location: X242

Photo Direction: east

Date: 11/8/99

Time: 11:15 am

I & M Canal

ILD 984 785 071

Sample Location: X243

Photo Direction: east

Date: 11/8/99

Time: 11:15 am

I & M Canal

ILD 984 785 071

Sample Location: X243

Photo Direction: west

Date: 11/8/99

Time: 2:30 pm

I & M Canal

ILD 984 785 071

Sample Location: X247

Photo Direction: north

Date: 11/8/99

Time: 2:30 pm

I & M Canal

ILD 984 785 071

Sample Location: X247

Photo Direction: west

Date: 11/8/99

Time: 12:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X244

Photo Direction: north

Date: 11/8/99

Time: 12:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X244

Photo Direction: east

Date: 11/8/99

Time: 1:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X245S/X245D

Photo Direction: north

Date: 11/8/99

Time: 1:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X245S/X245D

Photo Direction: east

Date: 11/8/99

Time: 2:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X246

Photo Direction: north

Date: 11/8/99

Time: 2:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X246

Photo Direction: west

Date: 11/8/99

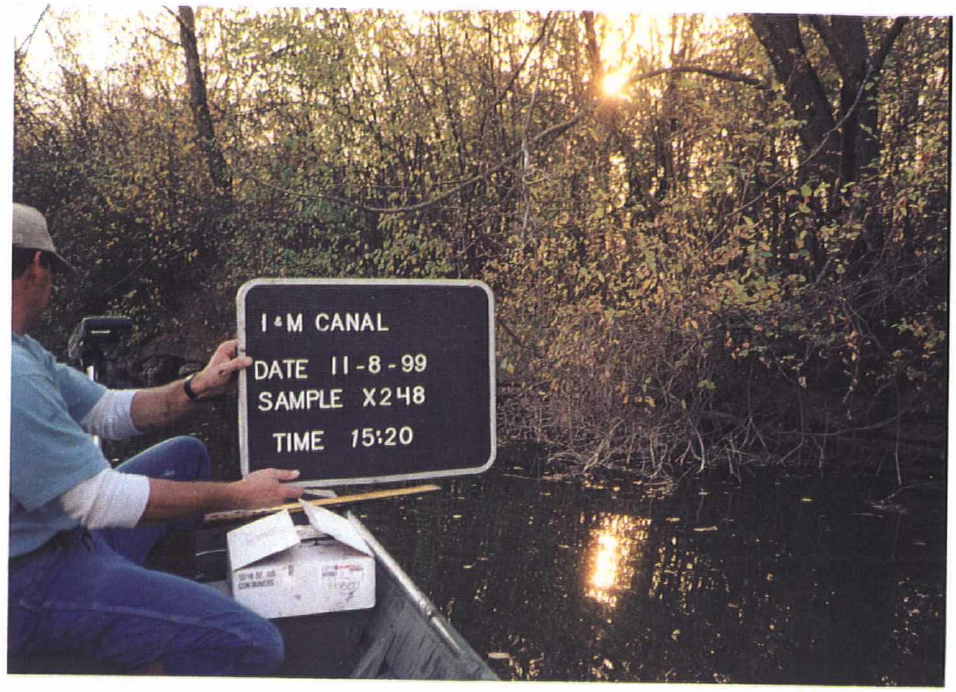
Time: 3:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X248

Photo Direction: north



Date: 11/8/99

Time: 3:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X248

Photo Direction: south

Date: 11/8/99

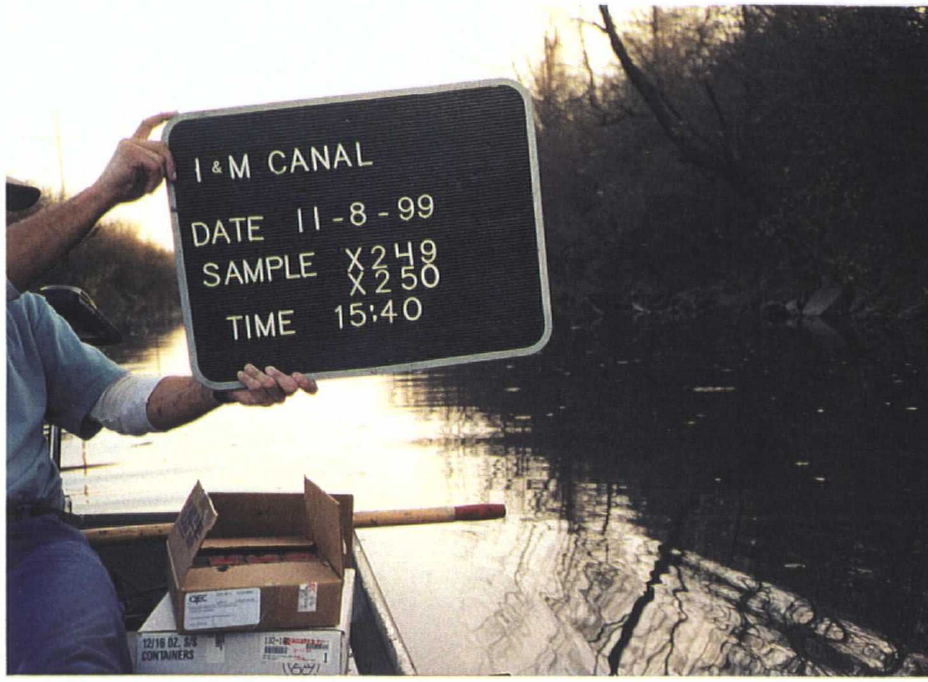
Time: 3:40 pm

I & M Canal

ILD 984 785 071

Sample Location: X249/X250

Photo Direction: north



Date: 11/8/99

Time: 3:40 pm

I & M Canal

ILD 984 785 071

Sample Location: X249/X250

Photo Direction: south

Date: 11/8/99

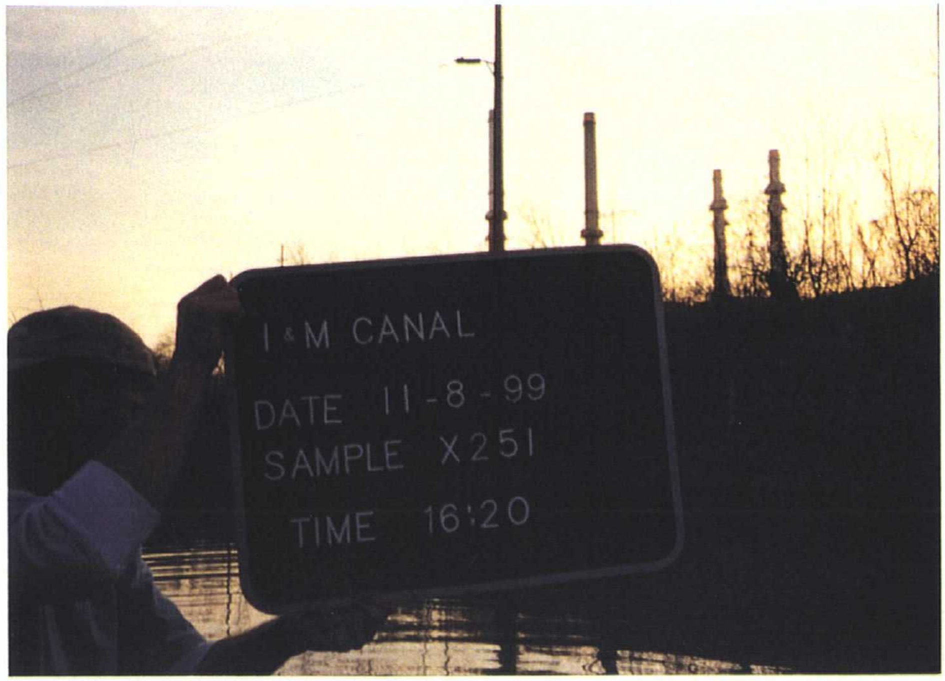
Time: 4:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X251

Photo Direction: north



Date: 11/8/99

Time: 4:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X251

Photo Direction: south

Date: 11/9/99

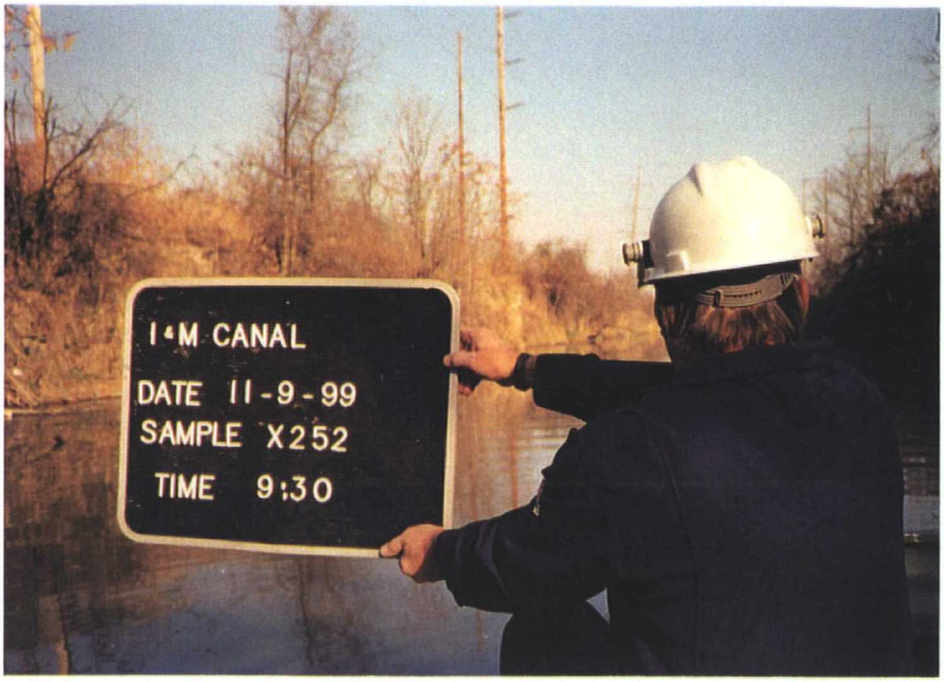
Time: 9:30 am

I & M Canal

ILD 984 785 071

Sample Location: X252

Photo Direction: north



Date: 11/9/99

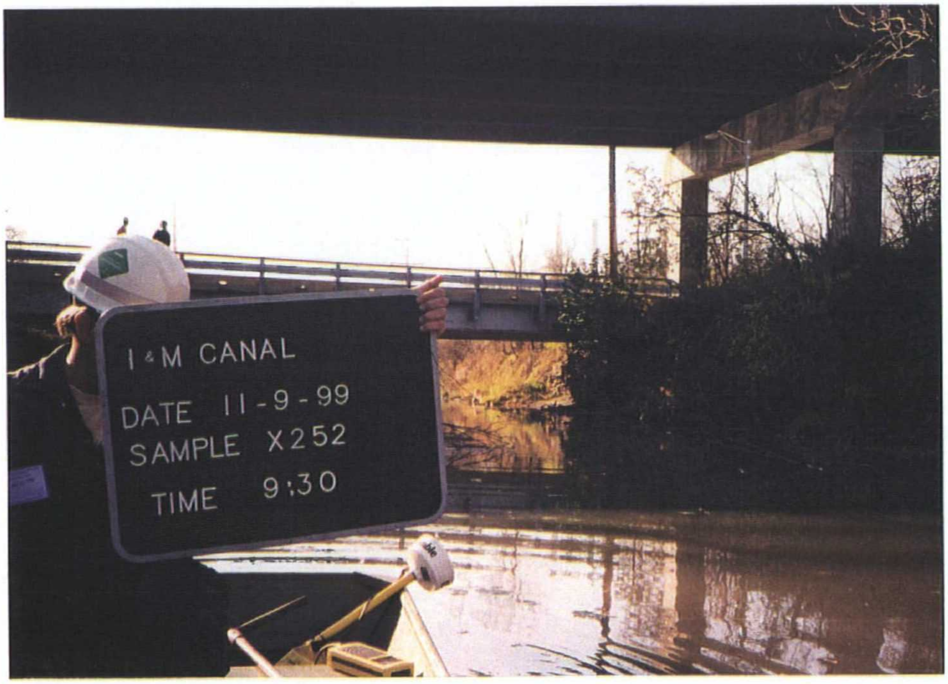
Time: 9:30 am

I & M Canal

ILD 984 785 071

Sample Location: X252

Photo Direction: south



Date: 11/9/99

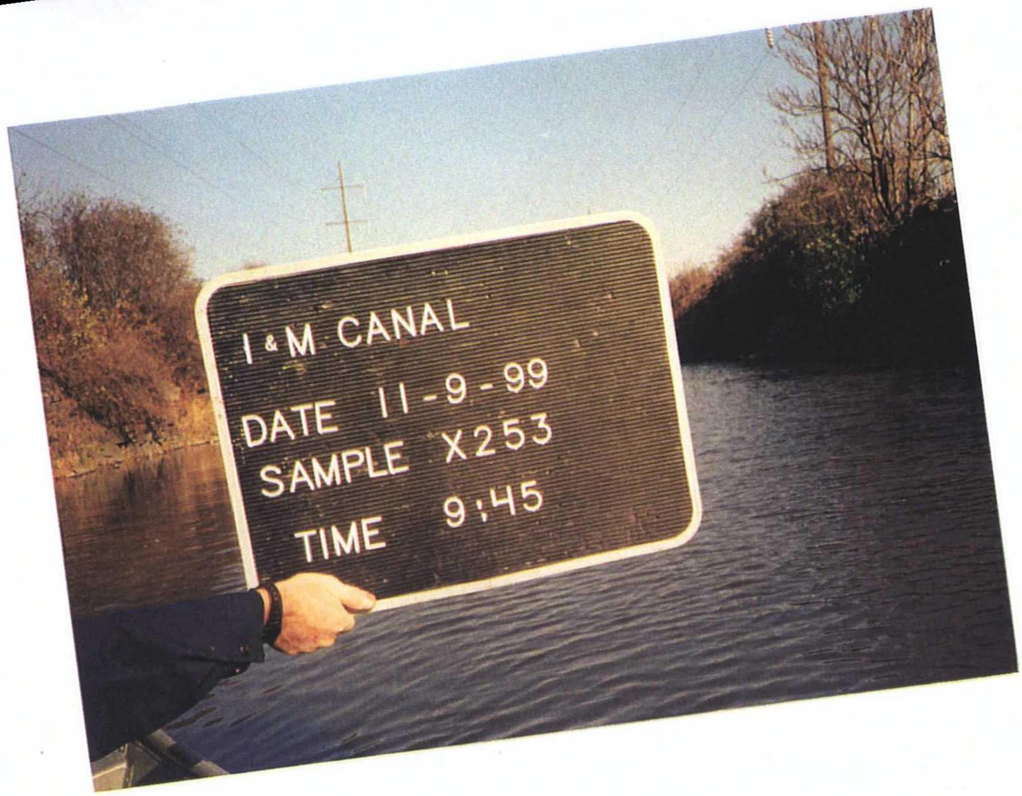
Time: 9:45 am

I & M Canal

ILD 984 785 071

Sample Location: X253

Photo Direction: north



Date: 11/9/99

Time: 9:45 am

I & M Canal

ILD 984 785 071

Sample Location: X253

Photo Direction: south

Date: 11/9/99

Time: 10:45 am

I & M Canal

ILD 984 785 071

Sample Location: X254

Photo Direction: northwest

Date: 11/9/99

Time: 10:45 am

I & M Canal

ILD 984 785 071

Sample Location: X254

Photo Direction: west

Date: 11/9/99

Time: 11:00 am

I & M Canal

ILD 984 785 071

Sample Location: X255

Photo Direction: north

Date: 11/9/99

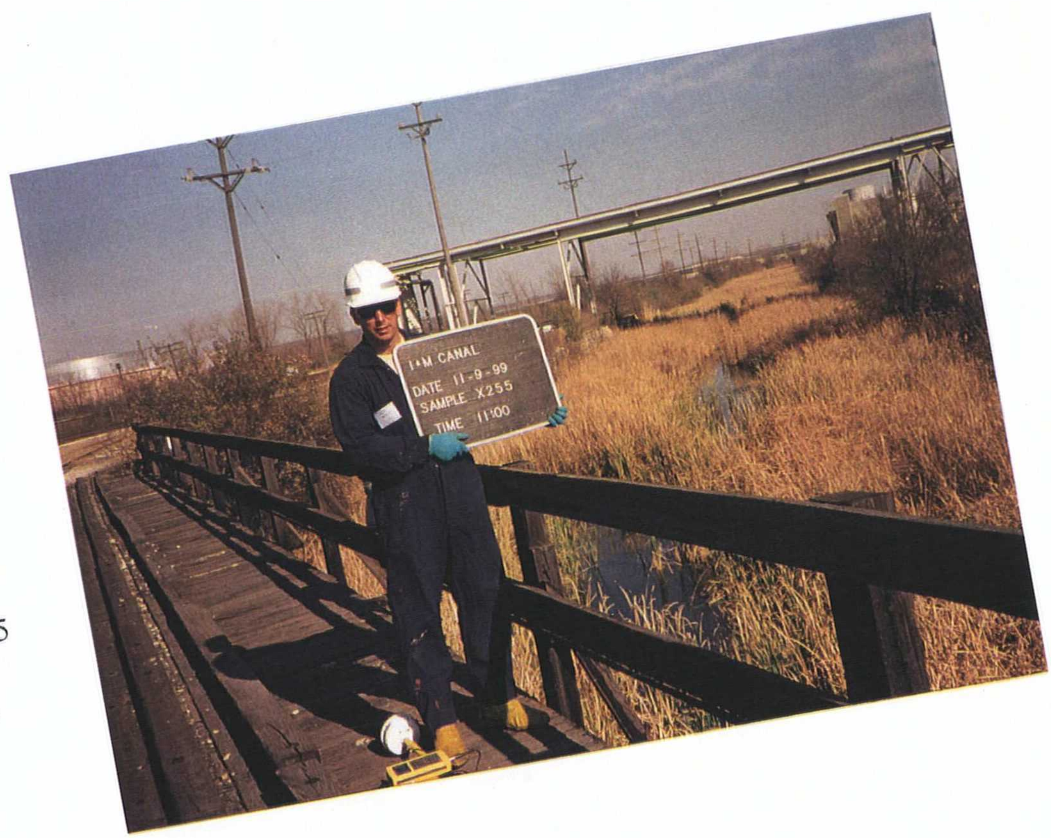
Time: 11:00 am

I & M Canal

ILD 984 785 071

Sample Location: X255

Photo Direction: west



Date: 11/9/99

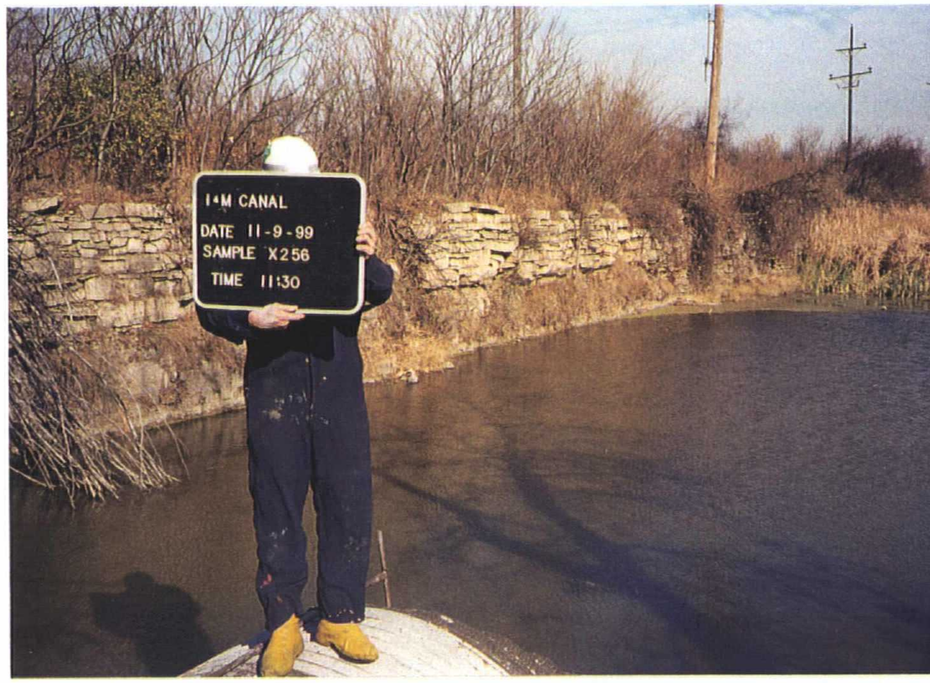
Time: 11:30 am

I & M Canal

ILD 984 785 071

Sample Location: X256/X257

Photo Direction: west



Date: 11/9/99

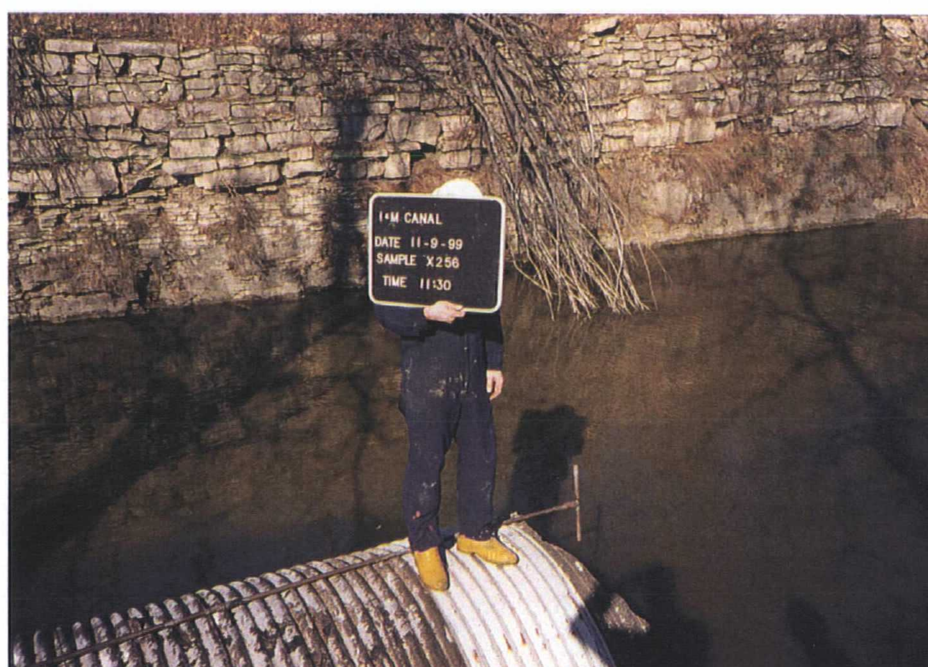
Time: 11:30 am

I & M Canal

ILD 984 785 071

Sample Location: X256/X257

Photo Direction: northwest



Date: 11/9/99

Time: 11:45 am

I & M Canal

ILD 984 785 071

Sample Location: X258

Photo Direction: west

Date: 11/9/99

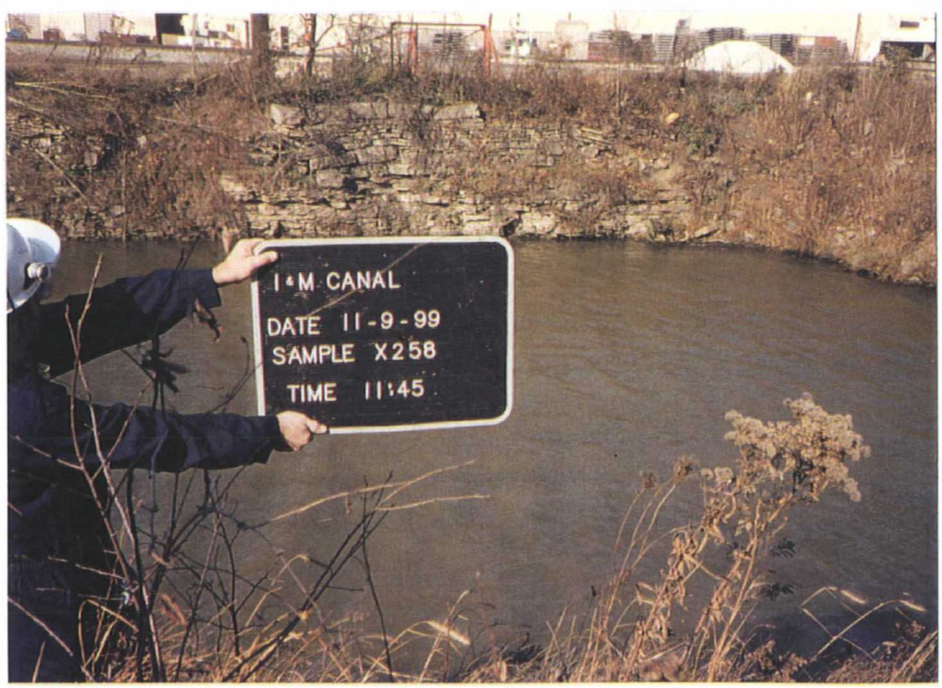
Time: 11:45 am

I & M Canal

ILD 984 785 071

Sample Location: X258

Photo Direction: northwest



Date: 11/9/99

Time: 1:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X259

Photo Direction: north

Date: 11/9/99

Time: 1:20 pm

I & M Canal

ILD 984 785 071

Sample Location: X259

Photo Direction: east

Date: 11/9/99

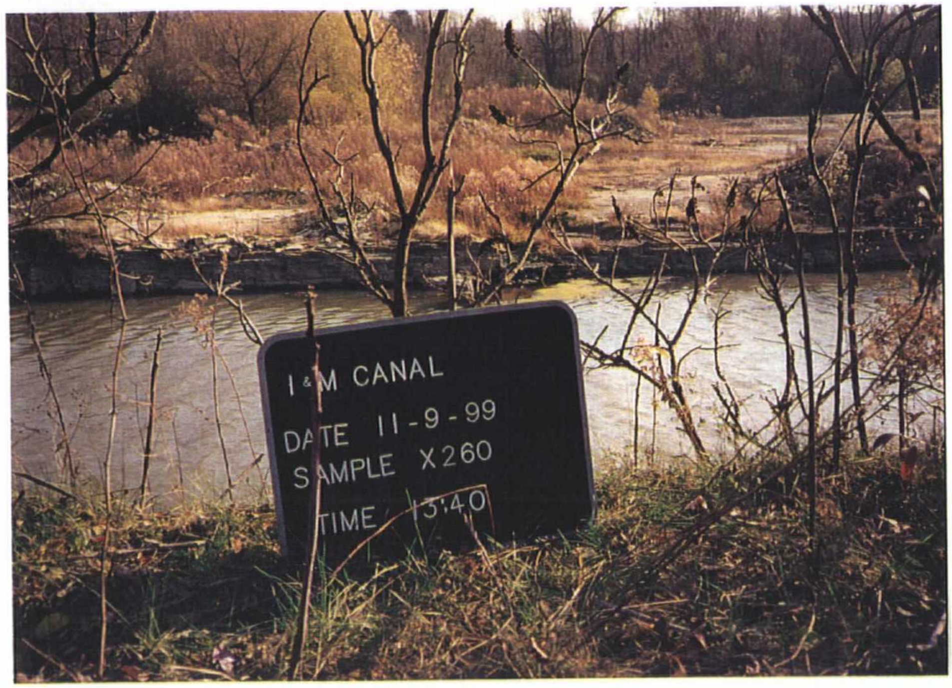
Time: 1:40 pm

I & M Canal

ILD 984 785 071

Sample Location: X260

Photo Direction: north



Date: 11/9/99

Time: 1:40 pm

I & M Canal

ILD 984 785 071

Sample Location: X260

Photo Direction: east

Date: 11/9/99

Time: 2:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X261

Photo Direction: north

Date: 11/9/99

Time: 2:00 pm

I & M Canal

ILD 984 785 071

Sample Location: X261

Photo Direction: east